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of the

Torrey Botanical Club

Vol. 18, No. 2

Editor
Tracy Elliot Hazen

The Genus Cuscuta

By

TRUMAN GEORGE YUNCKER

Issued 11 June, 1932

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MEMOIRS OF THE TORREY BOTANICAL CLUB

Volume 18, No. 2

The Genus Cuscuta

By

TRUMAN GEORGE YUNCKER

(WITH A CHART AND 158 TEXT FIGURES)

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The Genus Cuscuta

TRUMAN G. YUNCKER

INTRODUCTION

No important taxonomic study of the genus *Cuscuta*, as a whole, has been published since the appearance of Choisy's paper[1] in 1841, in which he included forty-one species, and which he further elaborated in the ninth volume of DeCandolle's Prodromus in 1845, and the very excellent monograph of Engelmann[2] describing seventy-seven species, which was published in 1859. The writer, in 1921, published a revision of the North American and West Indian species[3], and later, in 1923, a revision of the South American species.[4] In the present paper an attempt has been made to review all of the known species. Of the one hundred and fifty-eight species here recognized, twenty-five are believed to be new to science.

Distribution. The genus is world-wide in its distribution, but the largest number of species is to be found in the Americas where they extend from southern Canada on the north to Chile and Argentina on the south. In the Old World they extend from about the 60th parallel north in Europe and Asia to the Cape region of south Africa. They are found also, but in less abundance, in Australia and the islands of the Indian and Pacific Oceans. No specimens have been seen from the Philippine Islands, however, and Professor E. D. Merrill states that 'Although I spent 22 years in the Philippines, for the most part devoted to botanical work, I have never seen a specimen of *Cuscuta* from the islands, and I am confident that the genus is not represented there.' It is believed that many additional species will be discovered, especially in Mexico, South America, and Africa. The seeds of those species which infest economically important and widely grown crops have often been distributed with the seeds of their hosts. Such wide and unnatural distribution is especially true of *C. campestris*, *C. suaveolens*, *C. Epilinum*, *C. Epithymum*, and *C. approximata*.

The subgenus Grammica is found on all the continents, but with the largest number of its species occurring in the Americas. The subgenus Cuscuta is most abundant in the Mediterranean region, from whence it has spread to western Asia, Africa and throughout Europe. The subgenus Monogyna is found throughout Asia, Europe, and Africa, with one species, *C. exaltata*, indigenous to the southern United States.

[1] Choisy, Mém. Soc. Phys. Hist. Nat. Genève 9: 261–288. *pl. 1–5.* 1841.
[2] Engelmann, Trans. Acad. Sci. St. Louis 1: 453–523. 1859.
[3] Yuncker, Illinois Biol. Monogr. 6: 95–231. *13 pls.* 1921.
[4] Yuncker, Am. Jour. Bot. 9: 557–575. 1922; 10: 1–17. *pl. 1–5.* 1923.

TABLE 1

Number of species of each section found in different countries

COUNTRY	GRAMMICA		MONOGYNA		CUSCUTA			
	CLEISTO-GRAM-MICA	EUGRAM-MICA	MONO-GYNELLA	CALLI-ANCHE	CLEISTO-COCCA	PACHY-STIGMA	EPI-STIGMA	EUCUS-CUTA
North America								
Canada	5							1
United States	26	11	1					4
Mexico	10	32						1
Central America		8						
West Indies	4	5						1
Hawaiian Islands	1							
South America								
Venezuela	1	3						
Guiana		1						
Colombia	1	5						
Ecuador	2	6						
Peru	4	10						
Brazil	6	11						
Bolivia	2	5						
Chile	5	4						
Argentina	4	10						1
Uruguay	3	1						
Paraguay	2	2						
Galapagos Islands	2							
Africa								
Cape region	4	1	1			6		2
Central Africa	2	3	1					4
Northern Africa	1	1	1				1	8
Australia	6	1						1
New Zealand	1							1
Dutch East India	1		1	1				1
Polynesia	1							
Asia								
India	2	2	1	1			1	3
Asia Minor		1	1				1	6
Arabia								2
Persia			2				3	2
Afghanistan		1	1	1	1		2	1
Central Asia			4		1		1	3
China	2	1	4	1				1
Siberia		1	1					
Japan	2	1	1					
Siam		1						
Malay Peninsula	1							
Europe								
Great Britain	2							4
Norway								2
Sweden								2

TABLE 1 (*Continued*)

COUNTRY	GRAMMICA		MONOGYNA		CUSCUTA			
	CLEISTO-GRAM-MICA	EUGRAM-MICA	MONO-GYNELLA	CALLI-ANCHE	CLEISTO-COCCA	PACHY-STIGMA	EPI-STIGMA	EUCUS-CUTA
Russia	1		2					4
Germany	2		2					5
Austria-Hungary	2		1					5
Netherlands								3
Belgium								4
France	3		1					5
Spain								5
Portugal	1							4
Switzerland	1							4
Turkey			1					4
Greece	1		1					5
Bulgaria			1					3
Canary Islands								3

Phylogeny. The phylogenetic arrangement here presented differs from those worked out by former students of the group, but it is believed that it more clearly reflects the natural relationships within the genus. The relationships, as they are believed to exist in the genus, are illustrated in the chart on the following page.

The major evolutionary tendencies within the genus seem to be, in general, as follows:

1. From stalked to sessile flowers.
2. From loose to densely compacted inflorescences.
3. From capsules which remain closed to those which are regularly and definitely circumscissile when mature.
4. From styles which are distinct to those which are more or less united.
5. From stoutish, often subulate styles, to those which are slender and more elongated.
6. From globose, capitate stigmas to those which are more or less elongated.

The genus naturally divides itself into three subgenera on the basis of style, and stigma characters. The subgenus Grammica with mostly globose, capitate stigmas and distinct styles, has, it is believed, given rise to the other groups. It is the largest and most widely distributed of the three subgenera, members of the group being found throughout nearly the entire range of the genus. The origin of the subgenus Cuscuta proper, with its circumscissile capsules, separate styles and elongated stigmas, probably occurred from the subgenus Grammica, possibly from the section Cleisto-

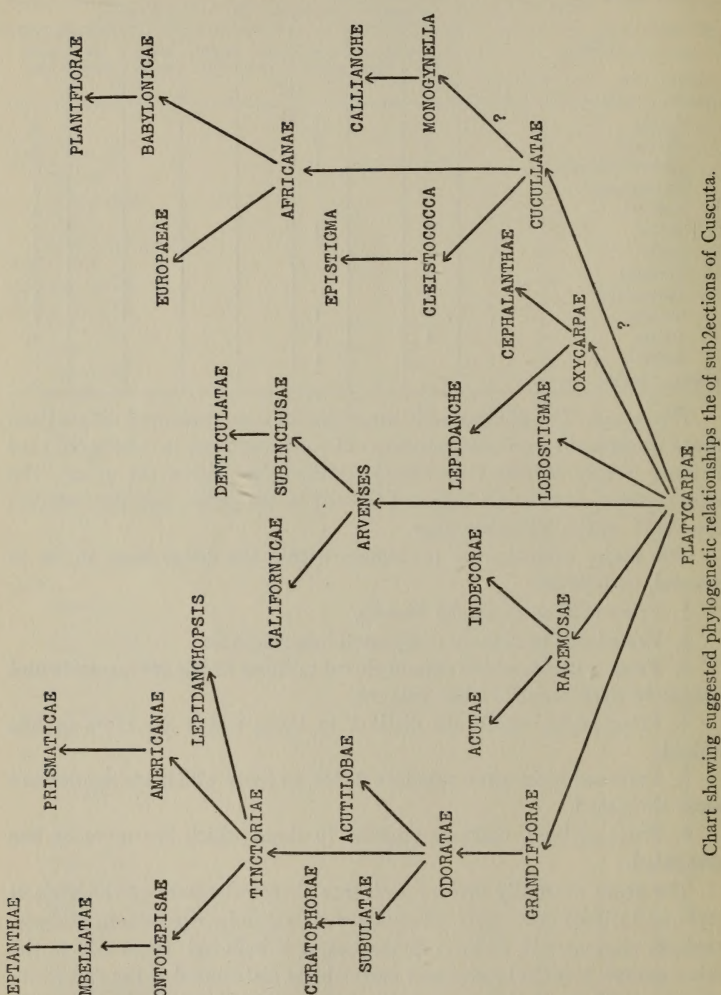

Chart showing suggested phylogenetic relationships the of sub2ections of Cuscuta.

grammica through the section Pachystigma. Members of the section Pachystigma, with their irregularly circumscissile capsules and conic to elongated stigmas, show unmistakable relationship with the section Cleistogrammica. The subgenus Monogyna, with its circumscissile capsule, united styles and variously shaped (never linear) stigmas, possibly arose from the section Eugrammica or from near the section Pachystigma.

Most species appear to be unquestionably distinct and readily recognizable. However, some show very close relationship with others making it difficult in some cases to clearly maintain specific distinction. Such a blending is especially true between the members of the section Planiflorae.

The taxonomic characters are, in the main, limited to the flowers and inflorescence. The stems rarely show anything of taxonomic value. A discussion of the taxonomic value of the different parts of the plant is given by the writer in his paper on the North American species. Careful microscopic study has been made of all of the species in an attempt to discover additional features which would be of use in distinguishing the different forms but nothing of any importance has been found.

Type collections. The type collections of all but a small number of the species included have been examined. Examination of the type materials is very essential with many species because the descriptions, and in some instances also the illustrations, are so broadly drawn that they might be applied equally well to different forms. The majority of the types of Engelmann's species are in the herbarium of the Missouri Botanical Garden, while those of other authors are to be found in the various American and European herbaria. Many of the types representing species described by the writer are deposited in the U.S. National Herbarium.

Names. All names which have ever been applied to members of the genus, so far as known, are included. Some of the names are doubtfully referred to certain species and are designated in the synonymy with a question mark. In a few instances it has been impossible to recognize the species to which names have been applied. These names are listed at the end of the paper. It is probable that some of these names have been applied to valid species which should be included, but it has been thought best to include only those species which have been examined or in other ways recognized.

Illustrations. Each species is illustrated with a text figure, in which an attempt has been made to show as accurately as possible those details of shape and proportion which will aid in identification. Each figure includes a drawing of the flower entire; the opened corolla; the opened calyx; the

pistil or matured capsule, or both; an individual scale; and, in some cases, a seed and a bract. The flowers are uniformly represented at about five times their natural size, and the individual scales at about ten times their natural size. With each species is listed the more important literature and illustrations.[5] No attempt has been made to include all illustrations which have been found, inasmuch as some of them are of little taxonomic value. It is believed that many of the species are here illustrated for the first time.

Specimens Examined. Under each species, with certain exceptions, are listed the specimens which have been examined by the writer. To avoid repetition, those specimens of the commoner American forms which were examined, and, for the most part listed in the writer's previous papers (see p. 113), have been omitted. It is also thought unnecessary to list the hundreds of specimens examined of *C. europaea*, *C. Epilinum*, and *C. Epithymum*, common and easily recognized European species.

Acknowledgments. During his study the writer has had the privilege of examining many thousands of specimens in the major collections of Europe and America. These include the collections of the University of California, Missouri Botanical Garden, U. S. National Herbarium, Gray Herbarium, New York Botanical Garden, Field Museum, Museum d'Histoire Naturelle at Paris, Kew, British Museum, Linnaean Herbarium, Delessert Herbarium, De Candolle Herbarium, Boissier Herbarium, Botanical Institute at Dahlem, Botanical Museum at Brussells, and many smaller collections. Professor Boris Fedtschenko sent a large number of Asiatic specimens from the herbarium of the Botanical Garden at Leningrad. The large collection of mostly Asiatic species of the herbarium of the University of Manila was sent on loan. Besides these, many specimens have been received from collectors and those in charge of herbaria from practically every part of the world where species of *Cuscuta* are to be found.

To those in charge of the herbaria visited, who so kindly placed the collections in their charge at his disposal, and who did so much to aid him in his work, and to those who so generously loaned or gave specimens, the writer wishes to express his grateful appreciation. He is also greatly indebted to Ethel Yuncker, his wife, for assistance in the bibliographic work and proofreading of manuscript as well as aid in making the illustrations.

A season of study in the European herbaria and libraries was made possible through a grant from the Bache Fund of the National Academy of Sciences. The completion of the work was greatly facilitated by this grant, and the writer expresses his great appreciation of this assistance.

[5] For a general bibliography of the genus see Yuncker, Illinois Biol. Monogr. 6: 169–181. 1921; and Proc. Indiana Acad. Sci. 36: 259. 1927.

SPECIES OF CUSCUTA LISTED SYSTEMATICALLY

Subgenus Grammica.

Section Cleistogrammica.

Subsection Platycarpae.

1 C. australis; var. Tinei; var. Cesatiana. 2 C. cordofana. 3 C. obtusiflora; var. glandulosa; var. latiloba. 4 C. victoriana. 5 C. cristata. 6 C. Polygonorum. 7 C. bifurcata. 8 C. Schlechteri.

Subsection Cephalanthae.

9 C. Cephalanthi.

Subsection Arvenses.

10 C. Tatei. 11 C. Stuckertii. 12 C. Harperi. 13 C. pentagona. 14 C. campestris. 15 C. plattensis. 16 C. glabrior; f. pedicellata; var. pubescens. 17 C. gymnocarpa.

Subsection Lobostigmae.

18 C. tasmanica; var. brevistyla.

Subsection Racemosae.

19 C. parviflora; var. elongata. 20 C. racemosa; var. miniata; var. nuda. 21 C. platyloba; var. triangulata. 22 C. suaveolens; var. densiflora; var. papillata. 23 C. decipiens. 24 C. pusilla. 25 C. peruviana.

Subsection Acutae.

26 C. appendiculata; var. macroflora. 27 C. Haughtii. 28 C. andina. 29 C. globosa. 30 C. acuta.

Subsection Californicae.

31 C. insquamata. 32 C. Jepsonii. 33 C. sandwichiana; var. kailuana. 34 C. brachycalyx; var. apodanthera. 35 C. occidentalis. 36 C. californica; var. papillosa; var. apiculata.

Subsection Indecorae.

37 C. stenolepis. 38 C. indecora; var. neuropetala; var. longisepala; var. integriuscula; var. bifida. 39 C. Coryli.

Subsection Subinclusae.

40 C. subinclusa. 41 C. Suksdorfii. 42 C. salina; var. major; var. apoda. 43 C. micrantha; var. latiflora. var. Holwayi.

Subsection Denticulatae.

44 C. Veatchii. 45 C. denticulata. 46 C. microstyla.

Subsection Oxycarpae.

47 C. Gronovii; var. Saururi; var. calyptrata. 48 C. curta. 49 C. rostrata.

Subsection Lepidanche.

50 C. cuspidata. 51 C. squamata. 52 C. compacta; var. efimbriata. 53 C. glomerata.

Section Eugrammica.

Subsection Grandiflorae.

54 C. grandiflora. 55 C. argentinana. 56 C. Friesii. 57 C. brevisquamata. 58 C. Kilimanjari; var. rukararana.

Subsection Odoratae.

59 C. chilensis. 60 C. Parodiana. 61 C. tucumana. 62 C. odorata; var. squar-

rulosa; var. Holwayana; f. papillosa; var. botryoides. 63 C. boliviana. 64 C. globiflora.

Subsection Subulatae.

65 C. rugosiceps. 66 C. jalapensis. 67 C. mitraeformis.

Subsection Ceratophorae

68 C. blepharolepis. 69 C. erosa. 70 C. Boldinghii. 71 C. chapalana.

Subsection Acutilobae.

72 C. rubella. 73 C. lucidicarpa. 74 C. bella. 75 C. purpurata; f. pallida. 76 C. xanthochortos; var. carinata; var. lanceolata. 77 C. paitana. 78 C. foetida; var: pycnantha. 79 C. acutiloba.

Subsection Tinctoriae.

80 C. chinensis; var. ciliaris. 81 C. applanata. 82 C. durangana. 83 C. corniculata. 84 C. incurvata. 85 C. tinctoria; var. Kellermaniana. 86 C. aurea. 87 C. mexicana. 88 C. trichostyla.

Subsection Americanae.

89 C. floribunda. 90 C. orbiculata. 91 C. cozumeliensis. 92 C. americana. 93 C. globulosa. 94 C. corymbosa; var. stylosa; var. grandiflora. 95 C. macrocephala.

Subsection Prismaticae.

96 C. prismatica.

Subsection Odontolepisae.

97 C. Purpusii. 98 C. costaricensis. 99 C. odontolepis. 100 C. dentatasquamata. 101 C. Hitchcockii. 102 C. Cockerellii. 103 C. Choisiana. 104 C. Ortegana. 105 C. partita. 106 C. potosina; var. globifera.

Subsection Umbellatae.

107 C. hyalina; var. nubiana. 108 C. umbellata; var. reflexa; var. dubia; var. desertorum. 109 C. Desmouliniana. 110 C. gracillima; var. esquamata. 111 C. saccharata. 112 C. lacerata. 113 C. fasciculata. 114 C. deltoidea.

Subsection Leptanthae.

115 C. tuberculata. 116 C. leptantha. 117 C. polyanthemos.

Subsection Lepidanchopsis.

118 C. strobilacea. 119 C. goyaziana. 120 C. bracteata. 121 C. serrata.

Subgenus Monogyna.

Section Monogynella.

122 C. exaltata. 123 C. cassytoides. 124 C. timorensis. 125 C. japonica; var. formosana; var. paniculata; var. fissistyla. 126 C. lupuliformis; var. asiatica. 127 C. gigantea; var. Engelmanni. 128 C. monogyna. 129 C. Lehmanniana; var. esquamata.

Section Callianche.

130 C. reflexa; var. anguina.

Subgenus Cuscuta.

Section Cleistococca.

131 C. capitata.

Section Pachystigma.

Subsection Cucullatae.

132 C. cucullata.

Subsection Africanae.

133 C. Gerrardii. 134 C. africana. 135 C. natalensis. 136 C. nitida. 137 C. angulata.

Section Epistigma.

138 C. Haussknechtii. 139 C. Kotschyana; var. caudata. 140 C. pulchella. 141 C. pedicellata.

Section Eucuscuta.

Subsection Babylonicae.

142 C. babylonica; var. elegans.

Subsection Europaeae.

143 C. europaea; var. indica; var. conocarpa. 144 C. madagascarensis; var. Schlechteri. 145 C. Epilinum. 146 C. kurdica. 147 C. palaestina; var. syriana.

Subsection Planiflorae.

148 C. triumvirati. 149 C. obtusata. 150 C. stenoloba. 151 C. Epithymum; var. macranthera; var. angustissima; var. alba; var. rubella; var. Kotschyi; f. acuta; var. sagittanthera; var. scabrella. 152 C. abyssinica; f. breviloba; f. membranacea; var. ghindensis. 153 C. brevistyla; var. biloba. 154 C. Balansae; var. mossamedensis. var. socotrensis; 155 C. somaliensis. 156 C. Letourneuxii. 157 C. planiflora; var. Godronii; var. sicula; var. ambigua; var. algeriana; var. papillosa. 158 C. approximata; var. urecolata; var. schiraziana; var. leucosphaera; var. Episonchum.

SYSTEMATIC ARRANGEMENT OF THE GENUS

Cuscuta [Tournefort] Linnaeus

Cuscuta Tournefort, Inst. Rei Herb. **1**: 652. *pl. 422*. 1700.—Linnaeus, Sp. Pl. 124. 1753.—Choisy, Mém. Soc. Phys. et Hist. Nat. Genève **9**: 268. 1841; also in DC. Prodromus **9**: 452. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 453. 1859.—Bentham & Hooker, Gen. Pl. *2*: 881. 1873.—Peter, in Engler & Prantl, Natürl. Pflanzenfam. 4^{3a}: 37. 1897.—Yuncker, Illinois Biol. Monogr. **6**: 110. 1921.

Hypogynous, sympetalous, herbaceous parasites (some species possess small amounts of chlorophyll and are thereby partially autophytic). Stems filiform, twining about woody or herbaceous hosts from which they obtain nourishment by means of haustoria. Leaves reduced to small, functionless scales. Flowers small, mostly more or less cymosely clustered, mostly gamosepalous, usually pentamerous (infrequently tri- or tetramerous); stamens inserted in the throat, alternating with the corolla lobes; scale-like, more or less fringed or fimbriated structures present in most of the species at the base of the corolla opposite the stamens; ovary two-celled, each cell containing two, anatropous ovules; styles distinct or united; stigmas capitate or linear-elongated. Fruit a capsule which remains closed, or opens with an irregular or defi-

nite line of circumscission near its base; embryo acotyledonous, filiform or with an enlargement at one end.

Cuscuta europaea L. is taken to represent the type species.

KEY TO THE SUBGENERA

Styles distinct (or sometimes lacking)
  Stigmas globose, flattened-peltate, convoluted, or infrequently ligulate (not elongated) ..... GRAMMICA p. 122
  Stigmas not as above, mostly much longer than broad ..... CUSCUTA p. 261
Styles united ..... MONOGYNA p. 248

Subgenus Grammica (Loureiro) Engelmann

Cuscuta group *Grammica* (Loureiro) Engelmann, Trans. Acad. Sci. St. Louis **1**: 459. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 115. 1921.
Grammica Loureiro, Fl. Cochinch. **1**: 170. 1790.
Kadula Rafinesque, Fl. Tellur. **4**: 90. 1836.
Anthanema Rafinesque, Fl. Tellur. **4**: 90. 1836.
Pentake Rafinesque, Fl. Tellur. **4**: 90. 1836.
Nemepis Rafinesque, Fl. Tellur. **4**: 90. 1836.
?Dastylepis Rafinesque, Fl. Tellur. **4**: 125. 1836.
?Eronema Rafinesque, Fl. Tellur. **4**: 125. 1836.
Lepidanche Engelmann, Am. Jour. Sci. & Arts **43**: 343. *pl. 6*. 1842.
Engelmannia Pfeiffer, Bot. Zeit. **3**: 673. 1845. Not Torrey & Gray nor Klotzsch.
Pfeifferia Buchinger, Ann. Sci. Nat. III. **5**: 88. 1846. Not Salm-Dyck 1845.
Cuscutina Pfeiffer, Bot. Zeit. **4**: 492. 1846.
Buchingera F. Schultz, Jahrb. Pharmacie 1847 (cf. Bot. Zeit. **6**: 760. 1848).
Cassutha Des Moulins, Études Org. Cusc. 40. 1853.
Epithymum Nieuwland & Lunell, Am. Midl. Nat. **4**: 511. 1916.

Flowers mostly pedicellate; capsules opening or remaining closed at maturity; the stigmas mostly globose, capitate, not infrequently convoluted and irregular, rarely conic or ligulate. Members of this subgenus are distributed naturally throughout the range of the genus, excepting northern and middle Europe. All of the native American species belong here.

KEY TO THE SECTIONS

Capsule not opening by circumscission ..... CLEISTOGRAMMICA p. 122
Capsule opening by circumscission ..... EUGRAMMICA p. 182

Section Cleistogrammica Engelmann

Cuscuta section *Cleistogrammica* Engelmann, Trans. Acad. Sci. St. Louis **1**: 490. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 137. 1921.

Flowers with or without numerous subtending bracts; calyx lobes united or distinct; capsule remaining closed at maturity (not circumscissile). The members of this section are found throughout the range of the genus, especially in North America where they predominate.

KEY TO THE SUBSECTIONS

Calyx gamosepalous, inflorescence not especially bracteate or congested
Capsules globose, or depressed-globose, sometimes thickened about the style bases
Capsules not especially thickened at the top
Infrastaminal scales present
Calyx lobes obtuse (acute in some species of RACEMOSAE)
Flowers mostly short-pedicellate (sometimes long pedicellate in *C. glabrior*), forming more or less compact, globular, cymose inflorescences
Corolla lobes obtuse (rarely acute)
Capsule depressed-globose, styles mostly short and subulate, intrastylar aperture large, withered corolla about or at base of the capsule ..... PLATYCARPAE p. 124
Capsule globose, styles mostly slender and equaling or exceeding the ovary, withered corolla at the top of capsule, calyptra-like, flowers commonly 4-parted ..... CEPHALANTHAE p. 133
Corolla lobes acute, spreading to reflexed, usually with inflexed tips, inflorescence commonly compact, capsules commonly depressed-globose
ARVENSES p. 134
Flowers mostly on pedicels equaling or exceeding the flowers (shorter in some forms of RACEMOSAE and ARVENSES), forming loose, cymose or racemose-paniculate inflorescences, capsules globose, often somewhat thickened at the top
Corolla lobes obtuse (or acutish in some species of RACEMOSAE)
Corolla lobes reflexed (not inflexed), stigmas flattened, styles much exceeding the ovary ..... LOBOSTIGMAE p. 142
Corolla lobes upright or spreading, tips more or less inflexed, stigmas often large and convoluted (not especially flattened) .....
RACEMOSAE p. 143
Corolla lobes acute, tips inflexed, calyx lobes obtuse or acutish
Flowers mostly as broad as long, corolla more or less globose .....
ARVENSES p. 134
Flowers mostly longer than broad, corolla campanulate (see also *C. sandwichiana kailuana* in subsect. Californicae) RACEMOSAE p. 143
Calyx lobes acute ..... ACUTAE p. 152
Infrastaminal scales lacking (present in *C. sandwichiana kailuana*) .....
CALIFORNICAE p. 156
Capsules globose, with a definitely thickened stylopodium, flowers more or less thick and fleshy, papillate or glandular ..... INDECORAE p. 161
Capsules ovoid, conic, or beaked, commonly longer than broad
Calyx and corolla lobes acute, edges mostly entire, seeds albuminous, embryo slender, capsules mostly 1-seeded (2–4 seeded in *C. Suksdorfii*) .....
SUBINCLUSAE p. 166
Calyx and corolla lobes obtuse, or, if acute, perianth segments denticulated
Flowers small (about 2 mm. long), embryo thickened in a terminal knob, endosperm lacking?, capsules 1-seeded, styles short ..... DENTICULATAE p. 170

Flowers larger, capsules mostly 2–4 seeded, embryo not as above, embedded in endosperm, styles mostly longer.....OXYCARPAE p. 172

Calyx polysepalous, inflorescence much bracteated, loose or, mostly, compact..... LEPIDANCHE p. 177

Subsection PLATYCARPAE

Subsection *Platycarpae* Engelmann, Trans. Acad. Sci. St. Louis **1**: 491. 1859.—Yuncker, Illinois Biol. Monogr. **6**: 137. 1921, in part.

Flowers mostly on short pedicels, perianth lobes mostly obtuse; infrastaminal scales entire or often bifid or reduced; capsules globose or, mostly globose-depressed, with large intrastylar apertures; styles short; withered corolla about, or mostly towards the base of the capsule.

KEY TO THE SPECIES

Corolla lobes obtuse (sometimes acute in *C. australis* and *C. obtusiflora*)
- Calyx lobes not overlapping nor carinate
  - Scales bifid (sometimes entire in *C. australis Cesatiana*), and mostly shorter than the tube
    - Corolla lobes equaling or exceeding the length of the tube, stamens with moderate filaments.....1. *C. australis*
    - Corolla lobes less than the tube length, filaments very short....2. *C. cordofana*
  - Scales mostly entire, shorter than, or exceeding the tube
    - Styles evident.....3. *C. obtusiflora*
    - Styles lacking, or very short.....4. *C. victoriana*
- Calyx lobes overlapping, often cristately carinate.....5. *C. cristata*

Corolla lobes acute, (may be obtusish in *C. bifurcata*) scales bifid or winged, mostly shorter than the tube
- Styles lacking, or nearly so.....4. *C. victoriana*
- Styles evident
  - Stamens arising in rounded sinuses, flowers mostly 4-parted
    - Flowers sessile or nearly so.....6. *C. Polygonorum*
    - Flowers mostly pedicellate.....7. *C. bifurcata*
  - Stamens not as above, flowers mostly 5-parted.....8. *C. Schlechteri*

1. Cuscuta australis R. Brown

Cuscuta australis R. Brown, Prodr. Fl. Nov. Holland. et Ins. Van-Dieman **1**: 491. 1810.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 280. 1841.—Bailey, Comp. Cat. Queensland Pl. 2d ed. *f. 1.* 1909. Not Hooker f.

Cuscuta Millettii Hooker & Arnott, Bot. Capt. Beechey's Voyage 201. 1841.

Cuscuta obtusiflora australis Engelmann, Trans. Acad. Sci. St. Louis **1**: 492. 1859.

Cuscuta Grassii Delponte, Mém. Accad. Sci. Torino II. **26**: 132. 1871.

Cuscuta Hygrophilae Pearson, Hooker's Icon. Plant. IV. **8**: *pl. 2704.* 1901.

Cuscuta Kawakamii Hayata, Icon. Pl. Formos. **5**: 125. 1915.

Cuscuta nuda Pilger, in herb.

Stems medium. Flowers about 2 mm. long, mostly 5-parted, glandulous, often obpyriform in fruit, on short pedicels, in compact, cymose glomerules. Calyx about equaling the corolla tube; lobes ovate-orbicular, obtuse, not overlapping. Corolla lobes orbicular-ovate, obtuse, upright to spreading, mostly shorter than, or about equaling the shallowly campanulate tube. Stamens shorter than the lobes; subulate filaments about equal to, or longer than, the oval anthers. Scales shorter than the tube, deeply bifid, with the lateral projections usually long and narrow. Styles stout and somewhat subulate, shorter than the globose ovary. Capsule globose, or somewhat obpyriform, styles subulate, intrastylar opening large; seeds oval, about 1.5 mm. long, hilum a short line.

Fig. 1. A-F, C. australis; G. var. Tinei.

This species, with its reduced scales, and shape and proportion of flower parts, seems to hold its own as a species, though closely related to *C. obtusiflora* with which Engelmann united it as a variety. It's distinct range would also seem to warrant its segregation. It is the only member of the section Cleistogrammica native in Oceanica with the possible exception of *C. obtusiflora latiloba*.

Turkestan and India to Manchuria, Korea and eastern China, and Japan, and southward to Java, Australia and New Guinea. Often on *Polygonum*, but also on a variety of other herbaceous plants as *Soja, Dianthera, Artemesia, Piper, Genista, Lespedeza, Glycine, Xanthium, Pelargonium*, etc.

Specimens examined.—India: Nagpur (*Clarke 33983A*); Sirguja, Lohardaga (*Clarke 33983B*).—China: (*McClure* in 1921); Tientsin (*Licent 1487; Clemens 1928A*); Canton (*Levine* in 1917; *Hance 10514; Levine 1047*); Nanking (*Merrill 11404*); Lotus Lake (*Steward 2303*); Hupeh Prov. (*Chun & Chien 8241*); Fukien, Fuchow (*Norton 1545*).—Malay Peninsula: Singapore (*H.M. 12124*); Johore (*Ridley 9161*, the type of *C. Hygrophilae*); Tonkin (*Bon 2127; 2796*).—Korea: Mokpo (*Dunn 4252*); Chinnampo (*Faurie 782*).—Manchuria: Lake Hanka (*Boknhof 311*).—Japan: (*Anuma* in 1905); Kitami (*Faurie 3861*); Nippon (*Faurie* in 1900); Isl. Sado (*Faurie 2522*); Musashi Prov. (Coll? in 1894); Formosa (*Faurie 370*); Tamsui (*Faurie 1494*).—Java: (*Hallier C160A*); Buitenzorg (*Bakhuizen van den Brink 3665; Backer 32298*).—Australia: 'New Holland' (*Caley; R. Brown*, the type, a specimen in the herbarium of the Missouri Botanical Garden); Victoria (*Johnstone* in 1915); Goulburn River (*Mueller*); Queensland, Rockhampton (*Boorman* in 1912); New South Wales, Gloucester (*Heron* in 1909); Port Macquarie (*Betche* in 1897).—New Guinea: Kaiser Wilhelm's Land (*Schlechter 18612*, labelled *C. nuda* Pilger in hb. Berol). A very large form was collected on *Linum* in Turkestan by Fedtschenko (no. *285*) which, except for its size, appears to be the same as this species. A specimen was also collected by Muenscher in 1926 on *Centaurea Cyanus* in Jefferson Co., New York.

Cuscuta australis Tinei (Insenga) n. comb.

Cuscuta Tinei Insenga, in Tineo, Plant. Rar. Sicil. 14. 1846.—Coste, Fl. France **2**: 574. *f. 2536*. 1903.—Malzew, Bull. Bur. Angew. Bot. *pl. 6. f. 82*. 1910.
Cuscuta breviflora Visiani, Flora Dalmat. **2**: 231. 1847.
Cuscuta aurantiaca Requien in herb.; Bertoloni, Flora Ital. **7**: 623. 1847.
Cuscuta chrysocoma Welwitsch in herb.; Des Moulins, Études Org. Cusc. 71. 1853.
Cassutha chrysocoma Des Moulins, Études Org. Cusc. 71. 1853.
Grammica chrysocoma Des Moulins, Bull. Soc. Bot. Fr. **1**: 298. 1854.
Cuscuta Rogovitschiana Trautvetter, Bull. Phys.-Math. Acad. Petersb. **13**: 376. 1855.
Cuscuta obtusiflora breviflora Engelmann, Trans. Acad. Sci. St. Louis **1**: 493. 1859.
Cuscuta Bidentis Berthiot, Billotia **1**: 15. 1864.
Grammica Bidentis Royer, Fl. de la Côte-d'Or 244. 1881.
Cuscuta obtusiflora Bidentis Rouy, Fl. France **10**: 361. 1908.

This variety has smaller, more reduced scales, often represented by two short wings near the base of the corolla. The flowers are often 4-parted and the obtuse, or sometimes acutish, corolla lobes about equal the corolla tube. Intermediates uniting this with *C. australis* are common.

Eastern and southern Europe from France and Portugal to Hungary, southern Russia, Turkey and India on a variety of hosts as *Polygonum, Scutellaria, Epilobium*, etc.

Specimens examined.—Portugal: (*Welwitsch 730; 1019*); Coimbra(*Ferreira 1656*). —France: Charente (*Camus 2440*); Côte-d'Or (*Billot 3436; 645; Genty* in 1896); near Villy-le-Moutier (*Genty 2793; 710; 3952*); Gironde (*Ramond* in 1867); Corsica: Ajaccio (*Requien* in 1850; 1847–48, the type of *C. aurantiaca*).—Hungary: (*Simonkai 2635; Janka* in 1865; *Tauscher* in 1875).—Turkey: Constantinople (*Boissier*).—India: Kashmir (*Duthie 11171*).—Russia: On the lower Wolga (*Liemaschko 227*).—Italy: Capua (*Bruni*). These last two specimens are also close to *C. australis*.

Cuscuta australis Cesatiana (Bertoloni) n. comb.

Cuscuta Cesatiana Bertoloni, Fl. Ital. **7**: 623. 1847.—Fiori & Paoletti, Icon. Fl. Ital. 337. *pl. 2853*. 1902.—Campanile & Traverso, Mem. R. Staz. Patolog. Veg. Roma **56**: 22. *f. 6, 7*. 1923.—Campanile, Annali di Bot. **16**: *f. 4, 5, 7*. 1926.
Cuscuta Polygonorum Cesati, in Index Seminum Genev. 22. 1849. Not Engelmann.
Cuscuta obtusiflora Cesatiana Engelmann, Trans. Acad. Sci. St. Louis **1**: 493. 1859.

Flowers mostly 5-parted. Corolla lobes commonly longer than the tube, obtuse or acutish and narrower than in *C. australis*. Scales narrow, more or less bifid and about reaching the stamens, or exserted. Filaments longer than the anthers. In herbaria *C. Gronovii calyptrata* is often erronously referred to this variety.

Switzerland and Italy to India, mostly on *Polygonum*. (One specimen seen from Korea seems to be identical with the other specimens from farther west.)

Specimens examined.—Italy: Pavia (*Traverso* in 1922); Piedmont (*Vesceil*); Vercelli (*Cesati*, taken to represent the type, a specimen in the herbarium of the Missouri Botanical Garden; *Malinverni 2769; Gibelli* in 1874); Monferrato (*Negri*).—Switzer-

LAND: Ticino (*Voigt* in 1919).—INDIA: Kashmir (*Stewart 3223; 3351; 6925½; Jacquemont 876*); Srinagar (*Schlagintweit* in 1856; *Clarke 29062*); Chumbi, alt. 7000 ft. (*Clarke 24058*).—KOREA: (*Taquet 1156*).

2. **Cuscuta cordofana** (Engelmann) n. sp.

Cuscuta obtusiflora cordofana Engelmann, Trans. Acad. Sci. St. Louis **1**: 493. 1859.

Flores 3 mm. longi, subsessiles. Calycis lobi lati, ovati aut orbiculares. Corollae lobi lati, ovati aut orbiculares, obtusi, breviores quam tubus campanulatus. Filamenta subulata, antherae orbiculares. Scalae oblongae, bifidae aut indentatae. Ovarium globosum, styli breves. Capsula globosa, non circumscissilis.

Stems medium. Flowers about 3 mm. long, sparingly glandular, subsessile, in globular clusters. Calyx enclosing the corolla tube, lobes broad, ovate to orbicular. Corolla lobes broad, obtuse, ovate, or more or less orbicular, upright, shorter than the campanulate tube. Stamens short, filaments stout, subulate, about equaling the orbicular anthers. Scales oblong, shorter than the tube, bifid or entire, variously fimbriated. Ovary globose, styles short, not especially subulate, intrastylar aperture large. Capsule globose, not circumscissile, the withered corolla about the lower part, styles not becoming strikingly subulate; seeds about 2 mm. long, ovate, hilum short and sub-lateral.

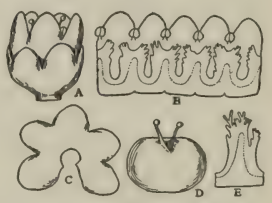

Fig. 2. C. cordofana.

This species is closely allied with *C. australis*, as Engelmann indicated, but seems to be sufficiently distinctive to warrant its segregation as a distinct species. It differs from *C. australis* in its shorter stamens, broad, nearly orbicular, lobes of the calyx and corolla, larger scales and short corolla lobes.

Through central Africa from Sierra Leone to Madagascar.

Specimens examined.—KORDOFAN: (*Figari*, the type, a specimen in the herbarium of the Missouri Botanical Garden).—SIERRA LEONE: Panguma (*Smythe 88*).—NIGERIA: Lagos (*Dalziel 1152; 1353*).—BELGIAN CONGO: (*Bequaert 4195*).—LIBERIA: Gola (*Bunting 89*).—UGANDA: Mouth Negusi River, alt. 2200 ft., on *Hydrocotyle* (*Bagshawe 1341*); edge of Bugona Forest (*Bagshawe 1398*).—GERMAN EAST AFRICA: Ouilimane (*Hahlman 112*); Usambara (*Holst 6909*).—CENTRAL MADAGASCAR (*Baron 2648*).

3. **Cuscuta obtusiflora** Humboldt, Bonpland & Kunth

Cuscuta obtusiflora Humboldt, Bonpland & Kunth, Nov. Gen. Spec. Pl. **3**: 122 (96 in folio edition). 1818.—Yuncker, Am. Jour. Bot. **10**: 2. *pl. 5. f. 29a–e.* 1923.

Cuscuta inodora Willdenow hb. no. 3164.

Cuscuta obtusiflora vera Engelmann, Trans. Acad. Sci. St. Louis **1**: 492. 1859.

Grammica obtusiflora Des Moulins, Billotia **1**: 15. 1864.
Cuscuta pentagona subulata Yuncker, Am. Jour. Bot. **10**: 3. 1923, in part.

Stems medium. Flowers about 2 mm. long, glandular, subsessile, in compact, glomerulate clusters. Calyx about enclosing the corolla tube, lobes unequal, rounded-ovate, obtuse, edges commonly irregularly serrulated, not overlapping. Corolla lobes triangular-ovate, acute or obtusish, spreading to reflexed, shorter than the short, campanulate tube. Stamens shorter than the lobes, filaments stoutish, and about equaling, or longer than, the oval or cordate anthers. Scales oblong, fringed at the often truncated or, less frequently, bifid apex, scarcely reaching the stamens, mostly free. Styles stoutish and subulate, shorter than, or about equaling, the globose ovary. Capsule globose-depressed, not circumscissile, styles subulate and divergent, intrastylar aperture large; seeds ovate, about 1.5 mm. long, hilum oblong, diagonal.

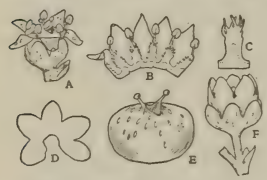

Fig. 3. A-E, C. obtusiflora; F, var. latiloba.

South America.

Specimens examined.—(*Willdenow hb. 3164*, type of *C. inodora*).—Brazil: (*Sellow 563*); Matto Grosso (*Moore 1036*); Corumba (*Hoehne 4016*); São Paulo (*St. Hilaire C¹1271*); Sorocaba (*St. Hilaire C²1271*).—Colombia: (*Triana* in 1851–57); Medellin (*Triana 2178*).—Ecuador: Guayaquil (*Jameson 542*).—Peru: Andes (*Humboldt*, the type, a specimen in the herbarium of the Missouri Botanical Garden).—Paraguay: River Ypacarai (*Hassler 3918*).—Argentina: Concepcion del Uruguay (*Lorentz 64;* in 1871).

Cuscuta obtusiflora glandulosa Engelmann

Cuscuta obtusiflora glandulosa Engelmann, Trans. Acad. Sci. St. Louis **1**: 492. 1859.
Cuscuta glandulosa (Engelmann) Small, Fl. S.E. United States 969. 1903.—Yuncker, Ill. Biol. Monogr. **6**: 138. *f. 41. 125, 143.* 1921.

Flowers often very glandular. Perianth lobes broadly ovate, obtuse; scales large, ovate, prominently fringed, mostly exserted. Otherwise as in *C. obtusiflora*. This variety intergrades with *C. obtusiflora* in the various characters so that it does not seem advisable to separate it as a distinct species, as Small has done. It appears to be the more northern form of the species.

Throughout the southern United States from California to Florida, and in the West Indies and northern Mexico, often on *Polygonum*.

Specimens examined.—United States:—California: San Bernardino Co. (*Parish*); San Bernardino (*Parish* in 1898).—Texas. Western Texas to El Paso (*Wright* in 1849); San Marcos (*Neally 92*); Dallas (*Reverchon* in 1878); Rio San Pedro (*Bigelow* in 1850; *Schott* in 1851).—Louisiana: (*Tainturier; Langlois 237*).—Oklahoma: Sapulpa (*Bush 1405*).—Georgia: (*Boykin*, the type, a specimen in the herbarium of the Missouri Botanical Garden).—Florida: (*Rugel 400*); Jamony (*Rugel* in 1843); St. George's Island (*hb. Chapman* in 1863).

West Indies:—Santo Domingo: Mao, Prov. de Santiago (*Abbott 1068*).—Cuba: (*Poeppig; Wright* in 1865; *van Hermann 686*); Prov. Oriente (*Ekman 4949*); Havana (*Wilson 1111; 1129; Ekman 196*); Anafe (*Ekman* in 1914).—Porto Rico: Sierra de Naguabo (*Britton, Britton & Cowell 2109*).

Mexico:—Durango: Durango (*Palmer 605*).

Cuscuta obtusiflora latiloba Engelmann

Cuscuta obtusiflora latiloba Engelmann, Trans. Acad. Sci. St. Louis 1: 492. 1859.
Cuscuta sulcata Wallich cat. no. 1320[3]. Not Roxburgh.

This variety was founded by Engelmann on an immature specimen collected by Wallich. The inflorescence is more paniculate than is characteristic of the associated forms. The lobes of the corolla and calyx are broadly oval-ovate, scales broad and prominent, and in most characters closely resembles the variety *glandulosa*. It may be that with more abundant materials this variety would more properly be considered an independent species and it is at present but tentatively placed here.

Specimens examined.—Burma: Martaban (*Wallich 1320*[3], the type, a specimen in the De Candolle herbarium). Known only from the type locality.

4. **Cuscuta victoriana** n. sp.

Flores circ. 1.5 mm. longi, plerumque 4-divisi, crocei, glandulosi, subsessiles, in glomerulibus paucifloribus. Calyx corollam includens, lobis orbicularibus. Scalae parvae, angustae. Ovarium depresso-globosum. Styli nulli. Corollae lobi triangulari-ovati, obtusi, aut aliquantum acuti, aequantes aut longiores quam tubus brevis.

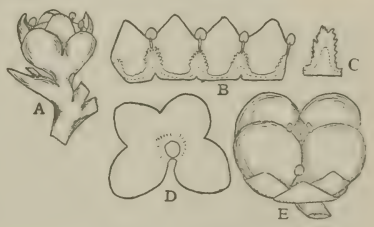

Fig. 4. C. victoriana.

Stems slender. Flowers about 1.5 mm. long, mostly 4-parted, reddish glandular, subsessile, in few-flowered glomerules. Calyx enclosing the corolla, lobes very unequal, orbicular, obtuse or acutish. Corolla lobes triangular-ovate, upright or spreading, obtuse or acutish, and about equal to, or slightly longer than, the very short tube. Scales small, narrow, about reaching the stamens, bridged low, processes short. Subulate filaments longer than the small, oval anthers. Ovary flattened-globose, styles lacking, or but very short, thick projections, stigmas flattened, often irregular. Capsule comparatively large, deeply lobed, and conforming to the shape of the developing seeds, not circumscissile, the withered corolla at the base, or early falling away; seeds about 1.25 mm. long, compressed on two sides, hilum short, diagonal.

Victoria and South Australia.

Specimens examined.—Australia. Victoria: Ovens Valley (*Johnstone* in 1915).—

South Australia: on *Tribulus* (*Winnecke* in 1900, the type, in the National Herbarium of New South Wales, Sydney); East and west of Flinder's Range (*Basedow* in 1902–04).

5. **Cuscuta cristata** Engelmann

Cuscuta cristata Engelmann, Trans. Acad. Sci. St. Louis **1**: 507. 1859.—Yuncker, Am. Jour. Bot. **10**: 8. *pl. 5. f. 28a–e.* 1923.

Stems medium. Flowers 2.5–3 mm. long, slightly fleshy and glandular, perianth segments frequently uneven, subsessile, or on short, stoutish pedicels which sometimes nearly equal the flowers, in few- to many-flowered, lateral clusters. Calyx as long as the corolla tube, lobes broadly ovate, obtuse, frequently with an uneven, cristate carina which may extend down onto the pedicel, overlapping. Corolla widely campanulate, early becoming somewhat globular about the developing capsule; lobes slightly shorter than the tube, ovate, obtuse, spreading, becoming reflexed in fruit. Stamens shorter than the lobes, the oval anthers about equal to the stout, subulate filaments. Scales reaching the stamens, or shorter, bridged below the middle, spatulate, truncated or, infrequently, bifid, sparingly fringed with medium-length processes, particularly about the upper half. Styles stoutish, much shorter than the large, globose ovary which is thickened at the top, stigmas small and convoluted. Capsule depressed-globose, thin towards the base where it may break away when pulled, carrying the withered corolla about it or towards the base, styles becoming divaricate, intrastylar aperture large and rhomboid; seeds about 1.5 mm. long, oblique, more or less rostrate, hilum oblong, oblique.

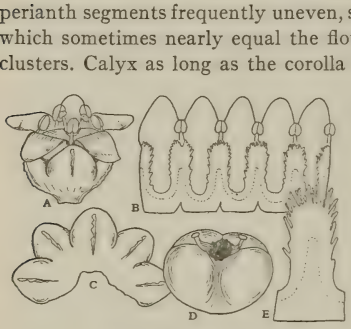

Fig. 5. C. cristata.

Central Argentina and Uruguay.

Specimens examined.—Argentina: Prov. St. Jago de Tucuman, La Plata (*Tweedy 1191*, the type, in the Kew herbarium); Parana (*Gibert 78*); Cordoba (*Lorentz 90; Galander* in 1880; *Millán 812; Lossen 314; Stuckert 6327; 9761*); Prov. de la Rioja (*Hieronymus & Niederlein 745; 846*); Buenos Ayres (*Beltfreund & Koester 342; Seler 72*); San Luis (*Miers 753*); Belgrano (*Burkart 450, 451*, on *Muhlenbeckia sagittifolia*); Chaco (*Stuckert 16341*).—Uruguay: (*Berg* in 1873).

6. **Cuscuta Polygonorum** Engelmann

Cuscuta Polygonorum Engelmann, Am. Jour. Sci. & Arts **43**: 342. *pl. 6. f. 26–29.* 1842.—Yuncker, Ill. Biol. Monogr. **6**: 139. *f. 39, 107, 150.* 1921. Not Cesati.

Cuscuta chlorocarpa Engelmann, Lond. Jour. Bot. **2**: 197. 1843; also in A. Gray, Man. Bot. 350. 1848.—Matthew, Bull. Torrey Club **20**: *pl. 165. f. 7.* 1893.—Britton &

Brown, Illust. Flora 3: 28. *f. 2959.* 1898.—2d ed. 3: 49. *f. 3445.* 1913.
?Cassutha americana Des Moulins, Études Org. Cusc. 70. 1853.
?Grammica americana Des Moulins, Bull. Soc. Bot. Fr. 1: 298. 1854.

Stems medium to slender. Flowers glabrous, about 2–2.5 mm. long, mostly 4-parted, subsessile, in compact, dense, glomerulate clusters. Calyx lobes triangular, often unequal, obtuse, as long as, or longer than, the corolla tube. Corolla lobes triangular-acute, upright, as long as, or slightly longer than, the short, campanulate tube. Scales oblong, about reaching the filaments, or shorter, mostly bifid, the processes mostly few and short and towards the top, bridged at about a quarter of their height or less. Stamens shorter than, or equaling, the lobes (sometimes exceeding them), anthers oval, pollen sacs sometimes widely separated by the connective, shorter than the subulate filaments which are situated more or less directly in the sinuses. Styles shorter than the globose-depressed ovary, becoming subulate and divergent. Capsule globose or often obpyriform, commonly depressed, appearing cubical about the developing seeds, intrastylar aperture large, rhombic; seeds about 1.3 mm. long, yellowish brown, roundish, slightly rostrate and compressed, hilum oblong, linear, transverse to oblique.

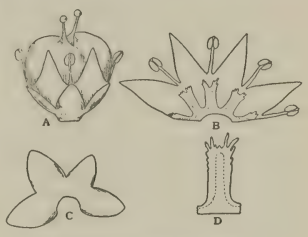

Fig. 6. C. Polygonorum.

The 4-parted flowers with oblong, bifid scales, long stamens and large capsule with subulate styles readily distinguish this species. Des Moulins' description of his *Cassutha americana*, taken from a poor specimen, seems to agree best with this species.

Type.—'West of St. Louis' (*Engelmann*, in the herbarium of the Missouri Botanical Garden).

Distribution.—From Ontario, Long Island, and the District of Columbia westward to Tennessee, Minnesota, and Nebraska. Mostly on *Polygonum*, but also found on *Lycopus*, *Penthorum*, etc.

7. Cuscuta bifurcata n. sp.

Flores 2–2.5 mm. longi, glandulosi, vulgo 4-divisi. Perianthi lobi oblongi aut lanceolati aequantes aut longiores quam corollae tubus insulse campanulatus. Scalae bifurcatae cum projectis longis exsertisque. Capsula depresso-globosa.

Stems medium. Flowers about 2–2.5 mm. long, glandular, mostly 4-parted, on pedicels about equaling, or shorter than, the flowers, in few-flowered, umbellate, cymes. Calyx about as long as, or sometimes exceeding, the corolla tube, lobes oblong to lanceolate, obtusish, or acute, deeply divided, lobes not

overlapping, sinuses rounded. Corolla lobes acute or obtusish, erect to spreading, lanceolate-oblong, about equal to, or often exceeding, the shallowly campanulate tube. Stamens shorter than the lobes, or about equaling them, anthers oval, filaments subulate and arising directly out of the rounded sinuses of the corolla. Scales bridged low, bifurcated, the lateral projections comparatively long, and exserted. Ovary globose, styles slender or slightly subulate, stigmas capitate. Capsule not circumscissile, depressed-globose, styles becoming slightly subulate in fruit, withered corolla towards the base; seeds about 2 mm. long, globose, flattened on two surfaces, slightly rostrate, hilum short, oblong, diagonal.

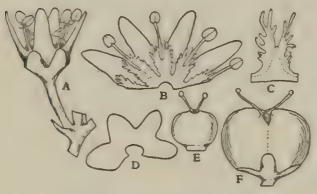

Fig. 7. C. bifurcata.

This species is closely related to *C. Polygonorum* from which it is to be distinguished by its longer pedicels, looser inflorescence, narrower corolla lobes, and more slender styles.

South Africa.

Specimens examined.—Cape Province, near Port Elizabeth on *Falkia repens* (*Mrs. Paterson 578*, the type, in the Kew herbarium); Transvaal, Kondebokkeveld near Sandriver, alt. 4500 ft. (*Schlechter 10110*).

8. **Cuscuta Schlechteri** n. sp.

Flores 3 mm. longi, breviter pedicellati. Calycis lobi oblongo-ovati, obtusi. Corolla campanulata, lobis lanceolatis, acutissime acutis. Stamina breviora quam lobi. Scalae oblongae, bifidae, facientes duas et angustas alas. Styli breves.

Flowers about 3 mm. long, on short pedicels, membranous, not glandular. Calyx about enclosing the corolla tube, deeply divided, lobes oblong-ovate, obtuse, slightly uneven along the edges, loose about the corolla. Corolla campanulate, lobes lanceolate, very sharply acute. Stamens shorter than the lobes, anthers globose, on filaments of about the same length. Scales oblong, bifid, forming two narrow, oblong wings, shorter than the tube. Ovary globose, styles short, stigmas capitate. Fruit not seen.

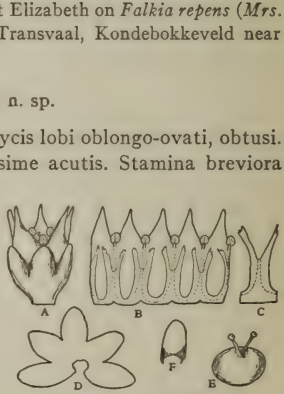

Fig. 8. C. Schlechteri.

This description, and the figures, are taken from a fragmentary specimen, but it shows features which, it is believed, distinguish it. The bifur-

cated scales, very sharply acute corolla lobes and the deep calyx set it off from *C. campestris* with which it may be very closely allied.

Specimens examined.—West Africa: Kamerun, Mundame, alt. 200 meters (*Schlechter 12927*, the type, in the herbarium of the Botanical Institute at Dahlem). Known only from the type locality.

Subsection Cephalanthae

Flowers short pedicellate and commonly 4-parted. Capsules globose, carrying the withered corolla at the top, calyptra-like.

9. **Cuscuta Cephalanthi** Engelmann

Cuscuta Cephalanthi Engelmann, Am. Jour. Sci. & Arts **43**: 336. *pl. 6. f. 1–6*, 1842.—Matthew, Bull. Torrey Club **20**: *pl. 164. f. 6*. 1893.—Britton & Brown, Illust. Flora **3**: 29. *f. 2962*. 1898; 2d ed. **3**: 50. *f. 3448*. 1913.—Yuncker, Ill. Biol. Monogr. **6**: 143. *f. 53, 57, 58, 142*. 1921; also Proc. Ind. Acad. Sci. **1919**: 159. *f. 2*. 1921.

Cuscuta tenuiflora Engelmann, London Jour. Bot. **2**: 197. 1843; also in A. Gray, Man. Bot. 350. 1848; also in Trans. Acad. Sci. St. Louis **1**: 497. 1859.

Epithymum Cephalanthi (Engelmann) Nieuwland & Lunell, Am. Midl. Nat. **4**: 511. 1916.

Stems medium. Flowers subsessile, or sessile (sometimes originating endogenously), glabrous, about 2 mm. long, commonly 4-parted (less frequently 3- or 5-parted), sometimes more or less glandular. Calyx shorter than the corolla tube, deeply divided, lobes overlapping, edges often slightly irregular, oblong-ovate, obtuse. Corolla cylindric-campanulate, becoming somewhat urceolate as the capsule matures, lobes ovate, obtuse, erect to spreading, much shorter than the tube. Scales oblong, narrow, fringed with scattered processes, reaching the filaments, bridged at about a quarter to a third of their height. Stamens mostly equal to, of slightly shorter than, the lobes, anthers oval to round, about equal to the stoutish filaments. Styles equal to, or slightly longer than, the globose, usually somewhat depressed, rarely ovoid, ovary. Capsule globose, about the same thickness throughout and with no stylopodium, often glandular, capped by the persistent withered corolla; seeds about 1.6 mm. long, light brown, globose, ovate or round, slightly oblique and compressed, hilum oblong, linear, oblique.

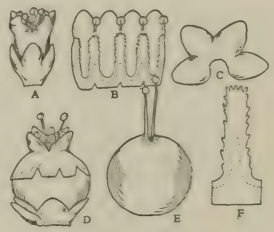

Fig. 9. C. Cephalanthi.

This species somewhat resembles the smaller forms of *C. Gronovii*, but differs with its commonly 4-parted flowers, in dense, compact inflorescences, and with usually depressed capsules capped by the withered corollas.

Across the United States from Maine to Oregon and Washington and southward to Virginia, Tennessee and Texas. A specimen collected by Albón (no. *4505*) at Monterey, Nuevo Leon, Mexico appears to be the same thing. On a variety of hosts such as *Aster, Tradescantia, Teucrium, Solidago, Cephalanthus, Vernonia, Boehmeria, Dianthera, Physostegia,* etc.

Type.—'On the margins of ponds and swamps near St. Louis' (*Engelmann*, a specimen in the herbarium of the Missouri Botanical Garden).

Subsection Arvenses

Capsules mostly globose, intrastylar opening moderate, corolla lobes acute, scales mostly prominent, withered corolla about the capsule, or mostly towards the base.

KEY TO THE SPECIES

Scales bifid or variously reduced
- Flowers mostly 4-parted, 1–1.5 mm. long ..... 10. *C. Tatei*
- Flowers mostly 5-parted, larger, scales oblong ..... 11. *C. Stuckertii*

Scales not bifid or reduced
- Calyx lobes overlapping at the base (but slightly so in some specimens of *C. campestris*) withered corolla at the base of the capsule
  - Calyx lobes broadly overlapping at the sinuses to form angles
    - Flowers about 1 mm. long, calyx lobes more or less carinate, commonly 4-parted ..... 12. *C. Harperi*
    - Flowers 1.5–2 mm. long, commonly 5-parted ..... 13. *C. pentagona*
  - Calyx lobes not overlapping to form angles at the sinuses, flowers mostly 2–3 mm. long ..... 14. *C. campestris*
- Calyx lobes mostly not overlapping at the base (or slightly so in some species), withered corolla at the base of the capsule, or about it
  - Calyx lobes oval-ovate or somewhat triangular
    - Scales moderately broad, not bifid, style slender
      - Flowers campanulate, scales shorter than the tube, flowers smooth ..... 15. *C. plattensis*
      - Flowers more or less globose about the developing capsule, verrucose or papillate, scales about equaling the corolla tube ..... 16. *C. glabrior*
    - Scales mostly narrow, often bifid, styles stoutish and slightly subulate ..... 11. *C. Stuckertii*
  - Calyx lobes orbicular-ovate, not verrucose or papillate, withered corolla about the lower part of the capsule ..... 17. *C. gymnocarpa*

10. **Cuscuta Tatei** n. sp.

Caules tenuissimi. Flores 1–1.5 mm. longi, 3- aut plerumque 4-divisi. Calycis lobi triangulari-ovati, acuti. Corollae lobi ovati-oblongi, acuti, aequantes aut excedentes tubum insulse campanulatum. Scalae vulgo truncatae aut bivolucres. Ovarium depresso-globossum, stigmata globosa. Styli breves tenuesque. Capsula depresso-globosa, non circumscissilis.

Stems very slender and matted. Flowers 1–1.5 mm. long, more or less

glandular, 3-, or mostly 4-parted, on pedicels mostly about equaling the flowers, or slightly shorter, in few-flowered cymules. Calyx enclosing the corolla, lobes triangular-ovate, acute. Corolla lobes spreading, ovate-oblong, acute, about as long as, or longer than, the shallowly campanulate tube. Stamens shorter than the lobes, filaments subulate, longer than the rounded anthers, pollen sacs widely separated by connective in some stamens, and in some flowers one or more of the stamens were found abortive. Scales variable, mostly truncated or two-winged, different forms being found in the same flower, shallowly fringed about the top, bridged low, barely reaching the stamens. Ovary depressed-globose, stigmas globose, styles short and slender. Capsule depressed-globose, comparatively large, not circumscissile, shape of capsule determined by the number of developing seeds about which it conforms as they develop, carrying the withered corolla at the base; seeds globose or flattened, sometimes slightly rostrate, about 1.5 mm. long, hilum a point or a very short line.

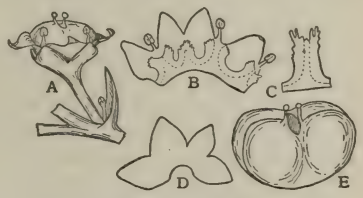

Fig. 10. C. Tatei.

This species is closely allied with *C. australis* from which it differs in the matted, slender stems, slender styles, shape of capsule and size of flowers. From *C. victoriana* it differs in the length of the styles and general appearance of the flowers.

Specimens examined.—Central Australia: Alice Springs (*Tate* in 1894, the type, in the herbarium of the University of Adelaide). Known only from the type locality.

11. **Cuscuta Stuckertii** Yuncker

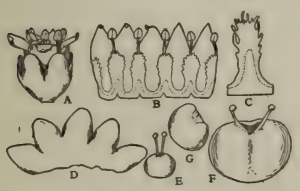

Fig. 11. C. Stuckertii.

Cuscuta Stuckertii Yuncker, Candollea **3**: 317. 1928.

Stems moderately slender. Flowers about 3 mm. long, sessile, or subsessile, in compact, globular clusters. Calyx about enveloping the corolla, lobes oval-ovate, mostly longer than broad, or orbicular, obtuse, edges commonly irregularly serrulated. Corolla loose about the ovary, campanulate, lobes shorter than or about equaling the tube, triangular-ovate, acute, spreading to reflexed, tips sometimes inflexed. Scales oblong, sometimes truncated, often bifid, fringed towards the top and about reaching the stamens, but not exserted. Filaments subulate and somewhat longer than the

oval anthers. Styles slightly subulate and about equal to the globose ovary. Capsule globose-depressed, styles becoming more or less subulate, intrastylar aperture wide, withered corolla about the lower part, not circumscissile; seeds about 1.5 mm. long, compressed on two sides, rounded on the other, hilum short, oblong, subterminal, diagonal.

This species differs from *C. pentagona* in the possession of a widely gaping intrastylar aperture, more or less subulate styles, narrow, often bifid, included scales and deeper calyx with longer lobes. It differs from *C. gymnocarpa* with which it is also closely related, in the longer, oval-ovate lobes of its larger and deeper calyx.

Specimens examined.—ARGENTINA: Cordoba, Rio IV (*Stuckert 20043*, the type, in the Delessert herbarium). Known only from the type locality.

12. **Cuscuta Harperi** Small

Cuscuta Harperi Small, Fl. S.E. United States 2d ed. 1361. 1913.—Yuncker, Ill. Biol. Monogr. **6**: 153. *f. 21, 123, 124.* 1921.

Stems very slender. Flowers commonly 4-parted, about 1 mm. long, on pedicels mostly as long as, or longer than, the flowers, in loose, racemose or umbellare clusters. Calyx shallow, the lobes short, broadly ovate, obtuse, frequently slightly keeled and tuberculate. Corolla lobes triangular-ovate, acute, about equaling the campanulate tube, upright, slightly fleshy, with their tips inflexed, in fruit upright or mostly reflexed. Scales narrow, infrequently bifid, fringed with a few short processes, particularly about the upper half, as long as, or somewhat longer than, the corolla tube, bridged at about a third of their height. Stamens shorter than the lobes, filaments slightly tapering and equal to the small, oval anthers. Ovary globose-oval, with a slightly thickened collar about the intrastylar aperture, styles slender, shorter than the ovary, stigmas capitate. Capsule oval, with the withered corolla at its base; seeds about 1–1.2 mm. long, ordinarily but one in a capsule, yellow brown, somewhat spherical, hilum a fine line, transverse or oblique, the umbilical area somewhat sunken.

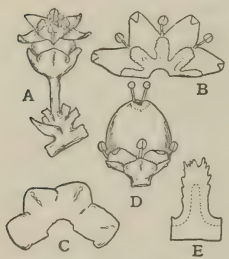

FIG. 12. C. Harperi.

This species appears to be rare. It closely resembles some of the smaller specimens of *C. pentagona*, but differs generally in the smaller size of its flowers which are mostly 4-parted.

Northwestern Alabama.

Specimens examined.—ALABAMA: On *Chondrophora virgata*, on sandstone rocks just above Noccalula Falls, Lookout Mountain, Etowah Co. (*Harper 147*, the type, in

the herbarium of the New York Botanical Garden); vicinity of Gadsden on *Chondrophora nudata* (*Pollard & Maxon 341*); DeSota Falls (*Ruth* in 1898).

13. **Cuscuta pentagona** Engelmann

Cuscuta pentagona Engelmann, Am. Jour. Sci. & Arts **43**: 340. *pl. 6. f. 22–24.* 1842.—Choisy, in DC. Prodr. **9**: 461. 1845.—Yuncker Proc. Ind. Acad. Sci. **1919**: 161. *f. 4.* 1921.

Cuscuta arvensis Beyrich in herb.—Engelmann in A. Gray, Man. Bot. 2d ed. 336. 1856, in part.

Cuscuta pentagona microcalyx Engelmann, Am. Jour. Sci. & Arts **45**: 76. 1845.

Cuscuta arvensis pentagona Engelmann, Trans. Acad. Sci. St. Louis **1**: 494. 1859.

Cuscuta globularis Nuttall in Engelmann, Trans. Acad. Sci. St. Louis **1**: 494. 1859, as synonym. Not Bertoloni.

Epithymum arvense (Beyrich) Nieuwland & Lunell, Am. Midl. Nat. **4**: 511. 1916, in part.

Cuscuta pentagona typica Yuncker, Ill. Biol. Monogr. **6**: 140. *f. 33a–e, 112, 127.* 1921.

Stems slender to medium. Flowers about 1.5 mm. long (in fruit about 2 mm. long), more or less glandular, on pedicels about equaling the flowers, in loose, cymose clusters. Calyx mostly about enclosing the corolla tube, loose, lobes short (mostly broader than long), broadly ovate, obtuse, broadly overlapping at the sinuses, forming angles, giving the calyx an angular appearance. Corolla lobes spreading, narrow, lanceolate, acute tips inflexed, about equaling the campanulate tube. Stamens shorter than the lobes, filaments slender, or somewhat subulate, longer than, or about equaling, the oval anthers. Scales becoming exserted, ovate, prominently fringed at the top. Styles slender, about equaling, or shorter than the globose ovary, stigmas small, globose. Capsule globose (sometimes ovoid), or somewhat depressed-globose, protruding from the withered corolla; seeds depressed-globose, often flattened on one surface, hilum short, oblong, terminal, transverse, about 1 mm. long.

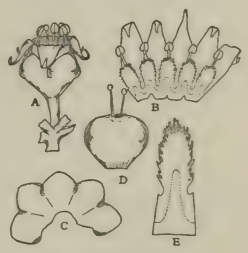

Fig. 13. C. pentagona.

In most of the manuals *C. arvensis* is the name applied to several forms of *Cuscuta* native to North America, especially in the United States. Beyrich first applied the name *C. arvensis* without any description to an herbarium specimen. In 1842 Engelmann described the same form as *C. pentagona*. At the same time, he considered Beyrich's *C. arvensis*, which he had not seen, as possibly synonymous with his *C. vulgivaga*, which is now known as *C. Gronovii*. Hooker, in 1840, in his Flora of North America, appears to have been the first to make reference to Beyrich's *C. arvensis* when he included the name as questionably synonymous with his *C. ameri-*

cana. It was probably in this publication that Engelmann first learned of the name *arvensis*. In Gray's Manual, second edition, in 1856, Engelmann used Beyrich's *arvensis* for the species which he had originally named *C. pentagona*, and also included with the typical form the varieties *microcalyx*, *calycina*, and *verrucosa*. It is now believed by the writer that these different forms represent distinct species. It would seem proper to retain Engelmann's name *C. pentagona* for the typical form, including his variety *microcalyx*. The name *arvensis* was never applied by Beyrich to the variety *calycina*, and, inasmuch as the name *calycina* had already been applied specifically by Webb and Berthelot to an Old World form, a new name is required for this species. I propose the name *C. campestris* as being appropriate. The varieties *verrucosa* and *pubescens* (which Engelmann subsequently established) I also consider to represent a distinct species. To this species Engelmann's varietal name *glabrior* of his *C. verrucosa* may be applied, because Sweet had previously applied the name *verrucosa* to an Asiatic species.

Most abundant in the eastern United States, but also found less frequently as far west as California. It occurs on a large variety of herbaceous hosts, as *Lespedeza*, *Euphorbia*, *Ceanothus*, *Aster*, *Ambrosia*, *Solidago*, *Artemisia*, *Anthemis*, etc.

Type.—On *Euphorbia* or *Tragia*, Norfolk, Virginia (*Rugel*, a specimen in the herbarium of the Missouri Botanical Garden).

14. Cuscuta campestris n. nom.

Cuscuta arvensis (?Hooker, Fl. Bor. Am. **2**: 77. 1840, as synonym without description) —Engelmann in A. Gray, Man. Bot. 2d ed. 336. 1856, in part.—Matthew, Bull. Torrey Club **20**: *pl. 164. f. 3*. 1893.—Smiley, Monthly Bull. Dept. Agr. Calif. **11**: 131. *f. 44c–e*. 1922. Not Beyrich.

?Cuscuta americana Hooker, Fl. Bor. Am. **2**: 77. 1840. Not Linnaeus.

Cuscuta pentagona calycina Engelmann, Am. Jour. Sci. & Arts **45**: 76. 1845.—Yuncker, Ill. Biol. Monogr. **6**: 141. *f. 33f–g*, *113*. 1921.—Campanile & Traverso, Mem. R. Staz. Patolog. Veg. Roma **56**: 18. *f. 4*, *5*. 1923.—Campanile, Annali di Bot. **16**: *f. 3*, *5*, *6*. 1926.

Cuscuta arvensis calycina Engelmann, Trans. Acad. Sci. St. Louis **1**: 495. 1859.

?Cuscuta arvensis Capsici Degen & Linhart, Zeitsch. Pflanzenkrank. **17**: 269. 1907.

Cuscuta pentagona subulata Yuncker, Am. Jour. Bot. **10**: 3. 1923, in part.

Stems medium. Flowers 2–3 mm. long (some specimens may be larger), often glandular, on pedicels mostly shorter than the flowers, in compact, globular clusters. Calyx about enclosing the corolla tube, lobes oval, or shorter and orbicular, or sometimes broader than long, mostly overlapping when young, but not protruding to form angles. Corolla lobes broadly triangular, acute, tips often inflexed, about equaling the short, campanulate tube. Stamens shorter than the lobes, filaments longer than, or about equaling, the oval

anthers, often more or less subulate. Scales ovate, abundantly fringed, exserted, bridged below the middle. Ovary globose, styles slender or somewhat subulate. Capsule usually depressed-globose, with the withered corolla at its base; seeds ovate, about 1.5 mm. long, flattened usually on one side, hilum short, oblong, terminal, transverse.

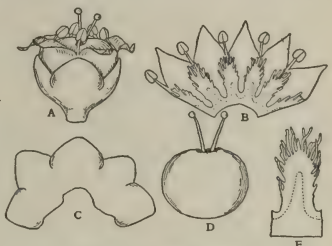

Fig. 14. C. campestris.

This is the species that is commonly known as *C. arvensis*. This name, however, was originally applied by Beyrich to a specimen of *C. pentagona*. It differs from *C. pentagona* in its calyx, which does not form prominent angles at the sinuses, and in its larger flowers with broader corolla lobes, and mostly shorter pedicels. It differs from *C. plattensis*, with which it is also closely allied, chiefly in its longer, more exserted scales and shorter, more rounded, calyx lobes. *C. arvensis Capsici* appears to be a very large form, but otherwise seems typical. Some of the specimens from the southern Pacific islands, notably *Gibbs 814*, *Setchell & Parks 228* and *Franc 737*, show very glandular flowers and have the calyx lobes more triangular and sometimes with acutish tips. Some of the South American specimens of this species have stoutish, or even subulate styles which I formerly designated as *C. pentagona* variety *subulata*. I also confused with that variety some specimens of *C. obtusiflora*.

Native in the United States, where it is more abundant westward. It is also found in South America and most other parts of the range of the genus. It is often found parasitizing clover and alfalfa and probably owes its wide distribution to the fact that its seeds are frequently associated with the seeds of these hosts. It has also been found on a great variety of other herbaceous hosts, as *Ipomoea, Xanthium, Aster, Pelargonium, Beta, Callistephus, Artemisia, Ambrosia, Dianthera, Bidens, Sonchus, Cirsium, Capsicum, Ammi*, etc.

Type.—Texas (*Lindheimer 126*, a specimen in the herbarium of the Missouri Botanical Garden).

Specimens examined from outside of the Americas, and which have not been previously listed.—West Indies:—Martinique: Fort de France (*Hahn 754; Debeaux* in 1897).—Porto Rico (*Sintenis 7012*).—South America:—Argentina: Prov. Buenos Aires (*Burkart* 3673), Belgrano (*Burkart 1206*), Pergamino (*Parodi 9577*).—England: Leicestershire, Hinckley (*Beardsmore*).—France: (*Gandoger* in 1920).—Italy: Aemilia, Prov. de Ferrara (*Feriola 2514*); Torino, Vercellae (*Voglino* in 1926); Lombardy, Pavia (*Traverso* in 1922).—Hungary: (*Linhart*, the type of *C. arvensis Capsici*, a specimen in the Kew herbarium).—Africa:—Dist. Potschefstroom (*Kretzschnar 85*); Natal, Pietermaritzburg (Entomologist at Cedara in 1918).—Australia:—Victoria: Trafal-

gar (*Cameron* in 1909).—New South Wales: Hawksburg Agr. Coll. (*Musson* in 1913.) —Queensland, Boonah (*Boorman* in 1914).—Japan: Musashi Prov. (*Buchtien 4510*). —Polynesia:—Fiji: (*Jeoward 84*); Viti Levu, Nadarivatu, alt. 2700 ft. (*Gibbs 214*).— New Caledonia: (*Franc 737*).—Tahiti: (*Miss Tilden 418; Setchell & Parks 228*); Road to Papenoo River (*Setchell & Parks 12*).—China: Foochow (*Metcalf 4765*).

15. **Cuscuta plattensis** Nelson

Cuscuta plattensis Nelson, Bull. Torrey Club **26**: 131. 1899.—Yuncker, Ill. Biol. Monogr. **6**: 143. *f. 35*. 1921.

Epithymum plattense (Nelson) Nieuwland & Lunell, Am. Midl. Nat. **4**: 511. 1916.

Stems slender to medium. Flowers glabrous, 2.5-3.5 mm. long, 5-parted, on pedicels about equal to the flowers, in panicled cymes. Calyx shorter than the corolla tube, lobes triangular, obtuse, slightly overlapping. Corolla lobes about equaling the broadly campanulate tube, triangular, acute (not 'short-ovate, obtuse, about half the length of the broadly campanulate tube'), slightly irregular in some, spreading or reflexed, with the tips inflexed. Scales shorter than the tube, slightly spatulate, copiously fringed with short processes. Stamens shorter than the lobes, anthers oval, about equal to the subulate filaments. Ovary depressed-globose, verrucose and thickened about the intrastylar aperture, styles slightly unequal, about equal to the ovary, or shorter. Capsule depressed-globose; seeds one to four in a capsule, about 1–1.5 mm long, oval or obovate, robust, hilum short, linear, transverse.

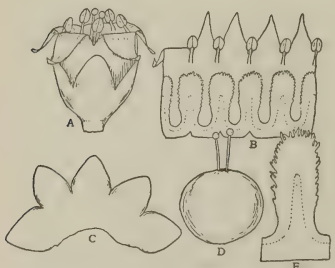

Fig. 15. C. plattensis.

This species is very closely related to *C. campestris*, but differs in the shorter scales with shorter processes, mostly larger flowers, with the corolla more nearly enveloping the capsule than is common for *C. campestris*, and with the calyx lobes commonly not overlapping.

Wyoming. On *Grindelia*, *Helianthus*, and *Solidago*.

Specimens examined.—Wyoming: Platte Canyon (*Nelson 2768*, the type, in the Rocky Mountain Herbarium, Univ. of Wyoming); Uva (*Nelson 2741*, mixed with *C. indecora*); Converse Co. (*Nelson 9118*).

16. **Cuscuta glabrior** (Engelmann) n. comb.

Cuscuta verrucosa glabrior Engelmann, Am. Jour. Sci. & Arts **43**: 341. 1842.

Cuscuta verrucosa Engelmann, Am. Jour. Sci. & Arts **43**: 341. *pl. 6. f. 25*. 1842. Not Sweet.

Cuscuta arvensis verrucosa Engelmann, Trans. Acad. Sci. St. Louis **1**: 495. 1859.

Cuscuta pentagona verrucosa Yuncker, Ill. Biol. Monogr. **6**: 142. *f. 111*. 1921.

Stems medium. Flowers 2.5–3 mm. long, commonly glandular-verrucose, particularly the calyx, subsessile, or often on pedicels longer than the flowers, in compact, or loose, globular cymose clusters. Calyx shorter than, or about equaling the corolla tube, lobes oval-ovate, not overlapping, sinuses often obtusish. Corolla somewhat globular and saccate between the lines of stamen attachment, often reddish, lobes triangular-acute or acuminate, about equaling the tube, spreading to reflexed, tips inflexed. Filaments about equal to the oval anthers. Scales ovate, abundantly fringed, mostly exserted. Styles about equal to, or exceeding, the globose ovary. Capsule depressed-globose, intrastylar opening large, withered corolla more or less enveloping the capsule which in some specimens easily breaks loose at the base and may be mistaken as circumscissile; seeds about 1 mm. long, globose, hilum terminal, short, oblong.

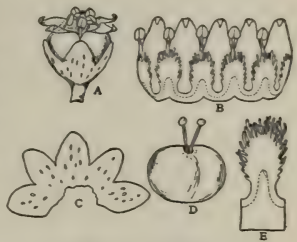

Fig. 16. C. glabrior.

This species is distinguished by the commonly verrucose or papillate flowers, the shape of its calyx lobes and corolla, and by having the withered corolla envelop the capsule rather than remain at the base as in *C. pentagona* and *C. campestris*.

Those specimens with pedicels longer than the flowers, thus forming loosely branching cymes, may be designated as forma **pedicellata** n.f.

Southwestern United States and northern Mexico.

Type.—'In dry sterile prairies, west of Houston, Texas' (*Lindheimer*, a specimen in the herbarium of the Missouri Botanical Garden).

Cuscuta glabrior pubescens (Engelmann) n. comb.

Cuscuta arvensis pubescens Engelmann, Trans. Acad. Sci. St. Louis **1**: 495. 1859.
Cuscuta pentagona pubescens Yuncker, Ill. Biol. Monogr. **6**: 142. 1921.

Flower parts more or less papillate-pubescent. Otherwise as in the typical form. Intermediates with partially papillate flowers which unite this with *C. glabrior* are not uncommon.

Throughout the range of *C. glabrior*.

Type.—Western Texas (*Lindheimer* in 1847, in the herbarium of the Missouri Botanical Garden).

17. Cuscuta gymnocarpa Engelmann

Cuscuta gymnocarpa Engelmann, Trans. Acad. Sci. St. Louis **1**: 496. 1859.—Yuncker, Am. Jour. Bot. **10**: 3. *pl. 4. f. 22a–e.* 1923.
Cuscuta sandvicensis Mimosae Hooker, Trans. Linn. Soc. London **20**: 205. 1846.

Stems slender to medium. Flowers about 2 mm. long, becoming 2.5–3 mm. long in fruit with the enlarged capsule, on pedicels about as long as the flowers, in few-flowered, globose, umbellate clusters. Calyx slightly shorter than the corolla tube, lobes orbicular-ovate, obtuse, or rarely slightly acutish, not overlapping. Corolla lobes triangular, very acute, upright to reflexed, with tips frequently inflexed, shorter than, or about as long as, the thin, campanulate tube. Scales reaching the stamens, ovate, fringed with moderate processes, bridged below the middle. Stamens shorter than the lobes, anthers oval, about equal to the stout, subulate filaments. Styles about equal to, or shorter than, the globose ovary. Capsule globose or slightly depressed-globose, the withered corolla remaining at the base, not circumscissile; seeds 2–4 in each capsule, about 1.5 mm. long, oval, hilum prominent, oblique or perpendicular.

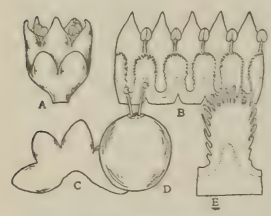

Fig. 17. C. gymnocarpa.

This species differs from *C. campestris* in having shorter, more upright, corolla lobes, shorter filaments and more globose capsules and with the calyx lobes not overlapping. It differs from *C. acuta* in having the corolla at the base of the protruding capsule, shorter corolla lobes and styles, and obtuse calyx lobes.

Galapagos Islands. On *Mimosa, Rhynchosia*, etc.

Specimens examined.—Galapagos Islands: James Island (*Charles Darwin* in 1835, the type, in the Kew herbarium); Albermarle Island, Cowley Bay (*Bauer 205*); Tagus Cove (*Stewart 3092*); Bindloe Island (*Snodgrass & Heller 769*); Narborough Island (*Snodgrass & Heller 318*).

Subsection Lobostigmae

Section *Lobostigma* Engelmann, Trans. Acad. Sci. St. Louis **1**: 512. 1859.

Engelmann considered the flattened, lobed stigmas of the single species included here as sufficiently distinctive to represent a separate section. I do not find the styles especially clavate, as Engelmann described them, and variously lobed or flattened stigmas are not uncommon in the genus.

18. **Cuscuta tasmanica** Engelmann

Cuscuta tasmanica Engelmann, Trans. Acad. Sci. St. Louis **1**: 512. 1859.
Cuscuta australis Hooker, Fl. Tasmaniae **1**: 278. 1860. Not Brown.

Stems slender. Flowers 4- or 5-parted, reddish glandular, 2–3 mm. long, on pedicels longer than the flowers, arranged in clusters of few-flowered, umbellate cymes. Calyx shorter than the corolla, lobes oblong, oval or ovate, ob-

tuse. Corolla lobes oval-oblong or ovate, obtuse, spreading or reflexed, about as long as the campanulate tube. Stamens shorter than the lobes, anthers oblong, about equal to the stoutish filaments. Scales oblong, fringed with medium length processes, bridged low and commonly with small processes on the bridge, sometimes bifid. Styles slender, becoming stoutish, much longer than the globose ovary, stigmas flattened and obscurely lobed. Capsule not circumscissile, globose, styles becoming subulate, carrying the withered corolla about it; seeds about 2 mm. long, oval, flattened on two surfaces, hilum oblong, transverse.

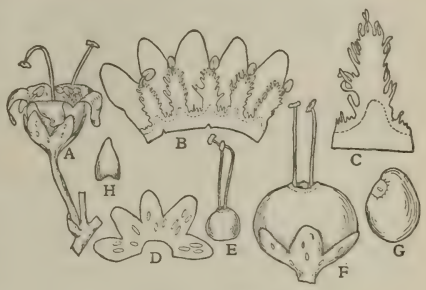

Fig. 18. C. tasmanica.

Tasmania and southeastern Australia.

Specimens examined.—Tasmania: Hobartstown (*Gunn 1991*, the type, in the Kew herbarium).—Victoria: (*Von Mueller*); Wimmera (*Pudney* in 1889).

Cuscuta tasmanica brevistyla n. var.

Styli breves et non longiores quam ovarium.

Styles short and not exceeding the length of the ovary. Otherwise as in *C. tasmanica*.

Specimens examined.—Victoria: Port Phillip (*Von Mueller* in 1869, the type, in the Kew herbarium). Known only from the type locality.

Subsection Racemosae

The species here included are common in South America. They mostly form loose, racemose inflorescences and have obtuse, or acutish, perianth lobes.

KEY TO THE SPECIES

Corolla lobes mostly obtuse, often with inflexed tips, flowers 1.5–3 mm. long.
  Flowers mostly less than 2 mm. long, campanulate.....19. *C. parviflora*
  Flowers mostly more than 2 mm. long, campanulate or cylindric
    Corolla cylindric, calyx mostly reaching but about half the length of the corolla tube, lobes rounded, flowers pedicellate in loose clusters.....20. *C. racemosa*
    Corolla more campanulate, calyx about reaching the sinuses of the corolla, flowers mostly shorter pedicellate.....21. *C. platyloba*
Corolla lobes acute, tips mostly inflexed, flowers 3–5 mm. long (if smaller 4-parted)
  Calyx lobes not overlapping, lobes about as broad as long, shorter than the corolla tube, flowers glandular
  Flowers mostly 5-parted

Edges of calyx lobes more or less revolute, causing the sinuses to appear rounded
22. *C. suaveolens*

Edges of calyx lobes not as above.....23. *C. decipiens*

Flowers mostly 4-parted.....24. *C. pusilla*

Calyx lobes more or less overlapping, sinuses not rounded nor revolute, longer than broad, about equaling the tube, flowers mostly not glandular...25. *C. peruviana*

19. **Cuscuta parviflora** Engelmann

Cuscuta parviflora Engelmann, Trans. Acad. Sci. St. Louis **1**: 506. 1859.

Cuscuta micrantha Martius in herb., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 506. 1859. Not Tineo nor Choisy.

Cuscuta parviflora typica Yuncker, Am. Jour. Bot. **10**: 7. *pl. 5. f. 25a–e.* 1923.

Stems slender, matted. Flowers 1.5–2 mm. long, on pedicels mostly much longer than the flowers, in loose, paniculate or fasciculate cymose clusters, pedicels and adjacent stems granulate. Calyx shorter than, or about equaling, the corolla tube; lobes ovate to triangular-ovate, obtuse or slightly acutish, slightly, if at all overlapping. Corolla lobes longer than the widely campanulate tube, spreading or upright, with inflexed tips, ovate, obtuse, or only slightly acutish. Stamens shorter than the corolla lobes, oval anthers about equal to, or shorter than, the slender filaments. Scales reaching the stamens, ovate, fimbriate, bridged below the middle. Styles about equal to the globose ovary. Capsules depressed-globose, much larger than the flowers, exserted, withered corolla persistent at the base, intrastylar aperture large, not circumscissile; seeds 1–1.25 mm. long, globose, hilum oblong, perpendicular.

Fig. 19. C. parviflora.

This is one of the smallest of the South American species. It produces capsules sparingly and only two or three mature fruits were seen in the several specimens examined.

Southeastern Brazil.

Type.—'Minas Geraes, on *Trembleya* (*Ackermann*).' Not seen.

Specimens examined.—Brazil: State of Minas Geraes, Ouro Preto (*E.W.D. & Mary M. Holway 1374; Ule 2652; Schwacke 7560*); Villa Rica (*Pohl 5726*, taken to represent a co-type, a specimen in the herbarium of the Missouri Botanical Garden).

Cuscuta parviflora elongata Engelmann

Cuscuta parviflora elongata Engelmann, Trans. Acad. Sci. St. Louis **1**: 506. 1859.—Yuncker, Am. Jour. Bot. **10**: 8. *pl. 5. f. 25f.* 1923.

Flowers 1–1.5 mm. long; calyx lobes acutish; stamens equal to or exceeding the triangular or lanceolate corolla lobes.

Central and southern Brazil.

Specimens examined.—Brazil: Goyaz (*Weddell 2125*, the type, in the herbarium of the Missouri Botanical Garden); São Paulo, Serra dos Pyreneos (*St. Hilaire C¹665*).

20. **Cuscuta racemosa** Martius

Cuscuta racemosa Martius in Spix & Martius, Reise Bras. **1**: 286. 1823.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 277. *pl. 3. f. 1.* 1841; also in DC. Prodr. **9**: 456. 1845. —Reiche, Fl. Chile **5**: 169. 1910.

Cuscuta racemosa brasiliana Engelmann, Trans. Acad. Sci. St. Louis **1**: 505. 1859.—Progel in Martius, Fl. Bras. **7**: 384. *pl. 125.* 1871.

Cuscuta microstyla obtusissima Progel in Martius, Fl. Bras. **7**: 385. *pl. 128. f. 4.* 1871.

Cuscuta racemosa typica Yuncker, Am. Jour. Bot. **10**: 5. *pl. 4. f. 23a–e.* 1923.

Stems slender. Flowers about 3 mm. long, membranous, or somewhat fleshy, reddish, or yellowish, more or less glandular, on pedicels mostly about as long as the flowers, in loose, racemose clusters. Calyx mostly shorter than the tube, lobes ovate, obtuse, ordinarily not overlapping (sometimes slightly so), longer than broad. Corolla lobes ovate, shorter than, or about equaling the campanulate tube, obtuse (or sometimes acutish), tips commonly inflexed. Stamens shorter than the lobes, the oval anthers about equal to the stoutish, subulate filaments. Scales mostly about reaching the stamens, oblong, copiously fringed, particularly about the upper half, bridged below the middle. Stigmas ordinarily large and frequently flattened, styles stoutish and not infrequently more or less subulate, equal to, or longer than, the globose or obovate ovary which is somewhat thickened at the top. Capsules globose, carrying the withered corolla about it; seeds 1–4 in each capsule, oval, about 2 mm. long, hilum short, perpendicular or oblique.

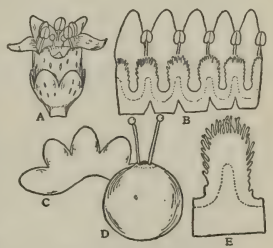

Fig. 20. C. racemosa.

Progel cites Burchell's *No. 2739* as representing his *C. microstyla obtusissima*. A specimen of this collection in the Kew herbarium is unmistakably *C. racemosa*. The flowers are young and the styles are not as elongated as they are in fully opened flowers, which may have led Progel to mistake this specimen for a new form.

Common through central and southern Brazil.

Type.—Province Rio de Janeiro, Brazil (*Martius* in 1817, a specimen in the herbarium of the Missouri Botanical Garden).

Cuscuta racemosa miniata Engelmann

Cuscuta racemosa miniata Engelmann, Trans. Acad. Sci. St. Louis **1**: 505. 1859.—Progel in Martius, Fl. Bras. **7**: 384. 1871.—Yuncker, Am. Jour. Bot. **10**: 6. *pl. 4. f. 23f.* 1923.
Cuscuta miniata Martius in Spix & Martius, Reise Bras. **1**: 286. 1823.
Cuscuta racemosa minuta Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 277. 1841.
Cuscuta miniacea Choisy in DC. Prodr. **9**: 456 (as footnote). 1845.
Cuscuta tenuicaulis Glaziou, Mém. Soc. Bot. France **3**: 491. 1911.

Stems smooth or sometimes papillate, the papillations extending part way onto the calyx in some specimens; calyx very short, the lobes commonly about as broad as long, or shorter, overlapping; flowers reddish and fleshier than those of the other varieties of *C. racemosa*.

Central and southern Brazil.

Specimens examined.—Brazil: (*Martius 1292*, the type?, a specimen in the herbarium of the Missouri Botanical Garden; *Ackermann* in 1832); Prov. Minas Geraes (*Vauthier 252; Schwacke 8202; Glaziou 19676*, the type of *C. tenuicaulis*, a specimen in the herbarium of the Botanical Institute at Dahlem; *St. Hilaire B¹2085; Langsdorf*); Prov. São Paulo (*St. Hilaire C²1488; Brade 6026; Lund 734*); Prov. Goyaz (*Glaziou 20422*); Prov. Matto Grosso, Cuyabá (*Riedel 846*, in part).

Cuscuta racemosa nuda Engelmann

Cuscuta racemosa nuda Engelmann, Trans. Acad. Sci. St. Louis **1**: 505. 1859.—Progel in Martius, Fl. Bras. **7**: 384. *pl. 128. f. 3.* 1871.—Yuncker, Am. Jour. Bot. **10**: 6. *pl. 4. f. 23f.* 1923.
?Cuscuta citricola Schlechtendal, Linnaea **22**: 808. 1849.
Cuscuta racemosa Regnelliana Progel in Martius, Flora Bras. **7**: 384. 1871.

Calyx lobes ovate, not overlapping, corolla lobes upright to spreading, about equal to the campanulate tube; capsule globose, exserted, intrastylar aperture large; scales oblong. This variety when not in fruit appears very much as the typical form and might also be mistaken for *C. platyloba*.

Southern Brazil.

Specimens examined.—Brazil: Near Rio (*Sellow*, the type?, a specimen in the herbarium of the Missouri Botanical Garden; *Burchell 667A*); São Paulo (*Glaziou 19677*); Prov. Minas Geraes, Caldas (*Regnell III-308*, the type of variety *Regnelliana*, a specimen in the herbarium of the Botanical Museum at Stockholm; (*Widgren* in 1845); Central Brazil, Salinas (*Weddell 2124*); Santa Catharina (*Ule 1848*); Parana (*Dusén 11349*).

21. **Cuscuta platyloba** Progel

Cuscuta platyloba Progel in Martius, Fl. Bras. **7**: 381. *pl. 127. f. 2.* 1871.—Yuncker, Am. Jour. Bot. **10**: 6. *pl. 5. f. 27a–e.* 1923.
Cuscuta racemosa calycina Engelmann, Trans. Acad. Sci. St. Louis **1**: 505. 1859.
Cuscuta suaveolens Lechler in herb., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 505. 1859. Not Seringe.

Stems slender. Flowers 2–4 mm. long, on pedicels mostly shorter than the flowers, in few- to many-flowered paniculate or racemose cymes. Calyx about equal to the corolla tube, lobes ovate, obtuse, more or less overlapping, entire or irregular, sometimes slightly carinate. Corolla lobes ovate, obtuse, overlapping, about equal to the campanulate tube, upright or becoming reflexed. Stamens shorter than the lobes, anthers oval, about equal to, or shorter than, the subulate filaments. Scales reaching the stamens, ovate, fringed with moderate processes, bridged at about the middle, or somewhat below. Ovary globose, styles slender and shorter than, or becoming longer than, the ovary, stigmas medium, or, infrequently, large and convoluted. Capsule globose, not circumscissile, but thin towards the base, with the withered corolla about it, styles becoming stoutish and sometimes slightly subulate; seeds two to four in each capsule, about 1.5 mm. long, hilum oblong, oblique.

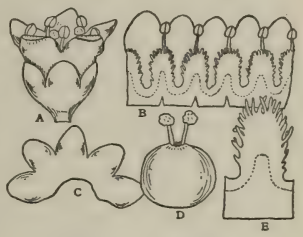

Fig. 21. C. platyloba.

It is believed that what Progel described as *C. platyloba* is a smaller form of Engelmann's *C. racemosa calycina*. It closely approaches *C. racemosa*, but shows characters that will allow of it being maintained as distinct.

Southern Brazil and Uruguay. 'Over low bushes,' 'in the tops of trees 20–30 feet high'; on *Solanum*, *Verbena*(?), *Apium*, etc.

Specimens examined.—Brazil: (*Sellow d318, 1873*); Rio de Janeiro (*Ule 3565; Glaziou 11279; Hillosen 2538*); Petropolis (*Ball* in 1882); Itatiaya (*E.W.D. & Mary M. Holway 1075, 1847*); Parana, Jaguaryahiva (*Dusén 10005*); Delta del Paraná (*Burkart 3394, 3761*); Minas Geraes (*St. Hilaire D557; Weddell*); Caldas (*Hillosen 4484*); Serra da Piedad (*Hoehne 6187*); Goyaz (*Glaziou 21805, 21808*); Santa Catharina (*Pabst 89*). —Uruguay: Bords du Rio Negro (*Gibert 284*); Bords du Santo Lucia (*Gibert 175*); Montevideo (*Fruchard* in 1874; in 1875; *Sellow 30*, taken to represent the type, a specimen in the U. S. National herbarium as sheet 616,886; *Gibert 46*, in part).

Cuscuta platyloba triangulata n. var.

Calycis lobi triangulariores. Corollae lobi aliquantum acuti.

Calyx lobes more triangular. Corolla lobes acutish. Otherwise similar to *C. platyloba*.

Specimens examined.—Argentina: (*Parodi 5604*); Apostoles, Gobernación de Misiones (*Parodi 6823;* the type in herb. Parodi, a fragment in the author's herbarium. On *Schinus*).

22. Cuscuta suaveolens Seringe

Cuscuta suaveolens Seringe, Ann. Sci. Phys. Nat. Agric. & Indust. **3**: 519. 1840.—Gay, Hist. Chile **4**: 448. 1849.—Reichenbach & Reichenbach f. Flora Germ. **18**: *pl. 1344. f. 3* (as *C. racemosa*). 1858.—Cusin, Herb. Fl. Francaise **16**: *pl. 20.* 1875.—Fiori & Paoletti, Icon. Fl. Ital. 337. *pl. 2854.* 1902.—Coste, Fl. France **2**: 574. *f. 2535.* 1903. —Hemsley, Jour. Bot. **46**: 241. *pl. 493.* 1908.—Yuncker, Am. Jour. Bot. **10**: 4. 1923. —Campanile, Annali di Bot. **16**: *f. 9, 10.* 1926.

Cuscuta corymbosa Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 276. 1841; also in DC. Prodr. **9**: 456. 1845. Not Jussieu nor Ruiz & Pavon.

?Cuscuta corymbosa pauciflora Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 277. 1841.

Cuscuta hassiaca Pfeiffer, Bot. Zeit. **1**: 705. 1843.

Epilinella migrans Pfeiffer, Bot. Zeit. **3**: 673. 1845.

Engelmannia migrans Pfeiffer, Bot. Zeit. **3**: 674. 1845.

Engelmannia suaveolens Pfeiffer, Bot. Zeit. **4**: 21. *pl. 1.* 1846.

Cuscutina suaveolens Pfeiffer, Bot. Zeit. **4**: 492. 1846.

Cuscuta diaphana Wenderoth, Fl. Hassiaca, etc. 346. 1846.

Pfeifferia suaveolens Buchinger, Ann. Sci. Nat. III. **5**: 88. 1846.

Cassutha suaveolens Des Moulins, Études Org. Cusc. 66. 1853.

Grammica suaveolens Des Moulins, Bull. Soc. Bot. Fr. **1**: 298. 1854.

Cuscuta popayanensis Poeppig in herb. Not. H.B.K.

Cuscuta chilensis Bertero in herb. Not Ker-Gawler.

Cuscuta racemosa chiliana Engelmann, Trans. Acad. Sci. St. Louis **1**: 505. 1859.— Reiche, Fl. Chile **5**: 169. 1910.—Yuncker, Ill. Biol. Monogr. **6**: 144. *f. 36, 94.* 1921.

Cuscuta floribunda Philippi, Fl. Atac. 37. 1861. Not. H.B.K.

Cuscuta racemosa Brand in Koch, Syn. Deutsch. u. Schw. Fl. 3d ed. 1981. 1902.

Cuscuta Medicaginis Wright in Dyer, Fl. Capensis **4**²: 86. 1904.

Cuscuta fragrans Orphanides in herb. Paris. Not Rusby.

?Cuscuta racemosa floribunda Reiche, Anal. Univ. Chile **120**: 819. 1907.

Stems slender to medium. Flowers 3–4 mm. long, more or less glandular, membranous, on pedicels mostly shorter than the flowers (sometimes longer), in racemose clusters. Calyx lobes shorter than the corolla tube, triangular-ovate, acutish, not overlapping, sinuses more or less rounded, edges often revolute. Corolla campanulate or funnel-form, becoming globular about the developing capsule, lobes ovate-triangular, upright, with acute, inflexed tips, about half to three-fourths as long as the tube. Stamens shorter than the lobes, filaments subulate, about equal to the oval or oblong anthers. Scales mostly not reaching the stamens, oblong ovate, or triangular, fringed with medium, processes, bridged below the middle. Styles slender, about equal to the globose ovary, or

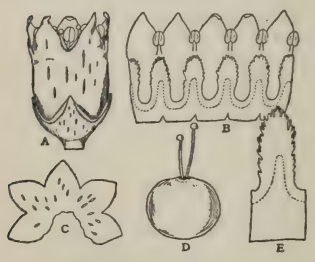

Fig. 22. C. suaveolens.

sometimes longer. Capsule globose, with the withered corolla about it, not circumscissile, two- to four-seeded; seeds 1.5–2 mm. long, roundish, hilum oblong, perpendicular.

This species occurs most frequently on leguminous hosts, especially *Medicago sativa*, with the seeds of which it has been disseminated throughout the world. It is usually easily distinguished by its moderately large yellow flowers in loose clusters, and also by the ordinarily revolute, and not overlapping, calyx lobes.

Native to the southern part of South America, but spread throughout the world as a contaminant of *Medicago sativa*. Also found on *Solanum*, *Vinca*, *Allium*, *Daucus*, etc.

Specimens examined.—United States:—Maryland: near Baltimore (*Hillman* in 1907).—California: Santa Cruz Mts. (*Davis* in 1908); North fork of Kern River (*Palmer 149*); lower Sacremento (*Jepson* in 1893); northern California (*Greene 1046*).—S. Dakota: White River (*Over 2355*).—Texas: Sanderson (*Wooton* in 1911).

South America:—Chile: (*Fr. Joseph 3874; Bertero 201 & 940; Peoppig*); St. Jago (*Gay 449*); Prov. Valdivia (*Lechler 479; Gay 203*); Rancagua (*Bertero 205*, type of Choisy's *C. corymbosa*); St. Augustin de Tango (*Reed* in 1867); Valparaiso (*Rusby 2000*); Prov. Santiago (*Philippi* in 1861; in 1862).—Uruguay: Salto (*Osten 3324*); Montevideo (*Gibert 46*, in part; *Fruchard*).

Australia:—Victoria: Sale (*Brittlebank* in 1915).—New South Wales: Walgett, Euroka Station (*Leake* in 1900); W. Maitland (*Mrs. Littlejohn* in 1922); Narrabri (Collector?); Adelong (Collector?).

Africa:—Algeria: Prov. Oran (*Warion 73; 1310;* in 1872; in 1874; *Kralik 1310*).—Cape of Good Hope, Queenstown (*Galpin 1760*, the type of *C. Medicaginis*).

Europe:—Germany: Coblenz (*Wirtgen*); Heidenhof bei Freiburg (*Braun* in 1848); Deidesheim (*hb. Bipont; Schultz*).—Greece: Attica (*Heldreich* in 1880); near Athens (*Orphanides 1156*, the type of *C. fragrans*).—France: Herault, Montpellier (*Mendon* in 1895); Lot et Garonne, Agen (*Garroute 512; Irat* in 1849); Vosges, Ramberviller (*Billot 152; Godron 806*); Isere, La Mure (*Sauze 512*); Rhone, Lyons (*Annter* in 1843; *Cosson & Germain;* the type locality also, but the type not seen).—Wales: Cardiff (*Pettigrew*).

Cuscuta suaveolens densiflora (Hooker f.) n. comb.

Cuscuta densiflora Hooker f., Fl. Novae-Zelandiae **1**: 186. 1854.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 506. 1859. Not Soyer-Will.

Engelmann considered this form, which was based on a single collection by Lyall at Port Underwood, as distinct, but I cannot see how it is to be so maintained. The perianth lobes are blunt and shorter than is normal for *C. suaveolens*, and the corolla lobes are not markedly inflexed. Only one seed was found in the capsules opened. Otherwise it appears to be similar to the typical form.

Specimens examined.—Port Underwood, New Zealand (*Lyall*, the type, a specimen in the herbarium of the Missouri Botanical Garden). Known only from the type locality.

Cuscuta suaveolens papillata n. var.

Pediculi et pars inferior calycis tenuiter papillati. Corolla campanulata.

Pedicels and lower part of the strongly appendiculate calyx finely papillate. Corolla campanulate. In other respects this variety closely resembles the typical form.

Specimens examined.—Prov. Coquimbo, Chile, altitude about 30 meters (*Werdermann 880*, the type, in the Delessert herbarium).

23. **Cuscuta decipiens** Yuncker

Cuscuta decipiens Yuncker, Ill. Biol. Monogr. 6: 145. *f. 43, 93, 95.* 1921.

Stems slender. Flowers about 3 mm. long, all parts white or reddish and covered with numerous, whitish, pellucid, glandular-appearing cells, 5-parted, subsessile, or on pedicels mostly as long as, or slightly longer than, the flowers. Calyx lobes ovate, obtuse, or acutish, somewhat shorter than the corolla tube, rarely overlapping. Corolla campanulate, lobes triangular-ovate, somewhat serrate, acute or obtusish, with inflexed tips. Scales as long as, or shorter than, the tube, deeply fringed, slightly spatulate, bridged at about a third of their height. Stamens shorter than the lobes, filaments about equal to the oval anthers. Styles slender and shorter than the globose, slightly umbonate ovary, stigmas capitate. Capsule globose-oval, slightly umbonate, with the withered corolla about it; seeds usually one or two in a capsule, about 1.7 mm. long, light brown or yellow, rostrate or hooked; hilum linear, oblong, oblique or transverse, the umbilical area scarcely contrasted with the rest of the seed.

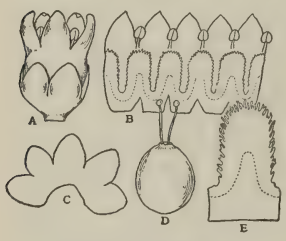

Fig. 23. C. decipiens.

This species resembles *C. indecora*, but is distinguished by its obtuse calyx lobes, less fleshy and smoother flowers, with scales which are ordinarily shorter, as well as by the capsule which is not thickened at the top. It differs from *C. racemosa* in its mostly shorter styles and from *C. glabrior* in its fleshier flowers, campanulate-cylindric corolla, and ovate, erect to spreading corolla lobes.

Central Mexico.

Specimens examined.—Mexico: Zacatecas, Hacienda de Cedros (*Lloyd 193*, the type, in the U. S. Nat. Herb. as sheet 574,160); Hilo de Oro (*Lloyd 28*); Cedros (*Kirkwood 50*).

24. **Cuscuta pusilla** Philippi n. sp.

Cuscuta pusilla Philippi in herb.

Flores 2–2.5 mm. longi, 4-divisi. Calycis lobi ovati, aliquantum acuti, non imbricati. Corollae lobi breviores quam tubus campanulatus. triangulari-ovati, acuti, apicibus inflexis. Scalae oblongo-ovatae, moderate fimbriatae. Styli aequantes ovario globoso.

Flowers 2–2.5 mm. long, on pedicels equal to, or longer than, the flowers, in umbellate cymose? clusters, mostly? 4-parted. Calyx about reaching the corolla sinuses, lobes ovate, acutish, not overlapping at the base. Corolla lobes somewhat shorter than the campanulate tube, triangular-ovate, acute with inflexed tips, upright to spreading. Stamens shorter than the lobes, slender filaments longer than the cordate or ovate anthers. Scales oblong-ovate, about reaching the stamens, bridged below the middle, moderately fringed. Styles about equal to the globose ovary. Capsule not seen, but the ovary does not give any evidence that it would be circumscissile.

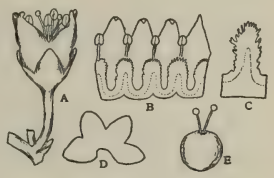

Fig. 24. C. pusilla.

This species differs from *C. micrantha* in the globose ovary, longer styles and stamens, inflexed corolla lobes and pedicelled flowers. It is close to *C. suaveolens*, but differs in having mostly 4-parted and smaller flowers.

Specimens examined.—Chile: Valdivia (*Philippi*, the type, in the herbarium of the Botanical Institute at Dahlem). Known only from the type locality.

25. **Cuscuta peruviana** n. sp.

Flores 4–5 mm. longi, tenues, membranacei, crocei, pediculi vulgo longiores quam flores. Calyx dimidio brevior quam corollae tubus, lobis ovatis, acutis. Corollae lobi triangulari-ovati, acuti. Stamina breviora quam lobi. Scalae oblongae, usque ad stamina. Styli multo longiores quam ovarium globosum. Stigmata aliquantum convoluta.

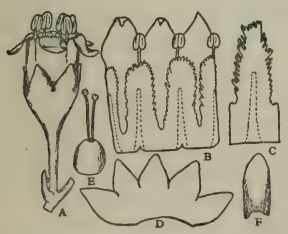

Fig. 25. C. peruviana.

Flowers 4–5 mm. long, thin, membranous, becoming reddish in color, on pedicels nearly as long as, or mostly longer than, the flowers, in loosely branching cymes?, bracts oblong, acute. Calyx about reaching the middle of the corolla tube, lobes ovate, acutish, longer than broad, slightly overlapping at the base. Corolla lobes triangular-ovate, acute, half to three-quarters as long as the cylindrical tube, erect to spreading and finally reflexed, thin, with

thicker lines running lengthwise below the stamen insertion and to which the scales are attached in their lower part. Stamens shorter than the lobes, anthers large, oval, longer than the subulate filaments. Scales oblong, reaching the stamens, fimbriate with medium length processes, bridged at about the middle, or below. Styles much longer than the globose ovary, stigmas somewhat convoluted. Capsule not seen.

This species is very closely allied with *C. suaveolens* from which it seems to be sufficiently distinguished by the larger, thinner, non-glandular, and reddish flowers, and also by its longer, non-revolute calyx lobes which slightly overlap.

Specimens examined.—PERU: (*Weberbauer 1551*, the type, in the herbarium of the Botanical Institute at Dahlem). Known only from the type locality.

Subsection ACUTAE

Flower parts mostly acute and flowers comparatively small. One species is from South Africa, the others from South America.

KEY TO THE SPECIES

Calyx lobes triangular-acute, or obtusish, appendiculate, pedicels mostly papillate-hispid.....26. *C. appendiculata*
Calyx not appendiculate
  Scales short, truncated, about reaching the middle of the tube.....27. *C. Haughtii*
  Scales longer, mostly reaching the stamens
    Flowers more or less elongated, 3–4 mm. long, papillate.....28. *C. andina*
    Flowers ordinarily about as broad as long
      Flowers less than 2 mm. long, on pedicels mostly about equaling the flowers... 29. *C. globosa*
      Flowers 2 mm. or more long, subsessile, on pedicels mostly shorter than the flowers.....30. *C. acuta*

26. **Cuscuta appendiculata** Engelmann

Cuscuta appendiculata Engelmann, Trans. Acad. Sci. St. Louis **1**: 503. 1859.

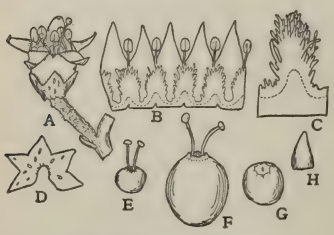

Fig. 26. C. appendiculata.

Stems slender to medium. Flowers 1.5–2 mm. long, more or less glandular, particularly the calyx, edges of calyx and corolla not uncommonly slightly uneven, on pedicels shorter than, or, not infrequently, exceeding the flowers, in loose, paniculate, cymose clusters, pedicels mostly hispid-papillose. Calyx shorter, than the tube, with wart-like appendiculations and roughened towards the base, the projections spar-

ingly produced on the pedicels near the flowers, lobes triangular, acute. Corolla lobes ovate-lanceolate, about equaling the campanulate tube, upright to spreading, tips acute to acuminate, inflexed. Stamens shorter than the lobes, filaments about equaling the oval anthers. Scales ovate, exceeding the tube, abundantly fringed with medium-length processes, bridged below the middle. Styles slender and equaling, or exceeding, the globose ovary, stigmas capitate. Capsule ovoid or globose, more or less pointed and roughened about the style bases, not circumscissile, with the withered corolla about the lower part; seeds globose and somewhat flattened, about 1.5 mm. long, hilum oblong, perpendicular.

Cape region of South Africa.

Type.—'Zwellendam, on dry hills through the whole district, *Krauss 1816.*' Not seen.

Specimens examined.—South Africa: (*Teufelsberg; Schlechter 10488; Scott Elliott 556*); Fritzikamma (*Schlechter 5973*).

Cuscuta appendiculata macroflora n. var.

Flores 3–4 mm. longi. Corollae lobi triangulari-ovati, acuti.

Flowers 3–4 mm. long, corolla lobes triangular-ovate, acute, broader than in the typical form. Otherwise similar.

Cape region, South Africa, on *Lycium* and other hosts.

Specimens examined.—Cape of Good Hope: Bedford, alt. 2800 ft. (*Bennie 250,* the type, in the Albany Museum at Grahamstown); Kimberley (*Hutton 923; Flanagan 1422*); British Kaffraria (*Cooper 337; Barber 32*); Somerset district, near Pearson (*MacOwan 1955*). Some of the above specimens are intermediate in their characters connecting this variety with *C. appendiculata.*

27. **Cuscuta Haughtii** n. sp.

Caules tenues. Flores 2–3 mm. longi, crocei-rubres, aliquantum carnosi. Calycis lobi triangulari-ovati, acuti. Corolla globosa, lobis triangularis-ovatis, acutis. Scalae breves, truncatae, sibi omnino coniunctae. Styli tenues, breviores quam ovarium globosum depressum.

Stems slender. Flowers 2–3 mm. long, yellowish-red, somewhat fleshy, on pedicels mostly shorter than the flowers, in cymose-umbellate clusters. Calyx scarcely as long as the corolla tube, loose, deeply divided, lobes triangular-ovate, acute, commonly revolute towards the base. Corolla globular, deeply furrowed along the stamen attachments, lobes about three-fourths as long as the tube, triangular-ovate, acute, spreading. Stamens shorter than the corolla lobes, filaments about as long as the orbicular anthers. Scales short, truncated, united to each other to the top, forming a more or less complete band half the length of the tube at its base, some-

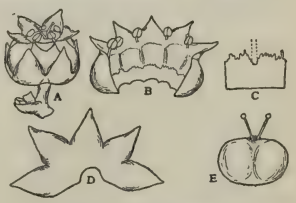

Fig. 27. C. Haughtii.

times rather deeply indented opposite the stamen attachments (bifid?). Styles slender, shorter than the globose-depressed ovary, stigmas small, globose. Capsule depressed-globose, enveloped by the withered corolla, not circumscissile (the specimen examined was not abundant, but so far as could be determined the capsule remains closed at maturity); seeds about 1 mm. long, rounded, flattened on one surface, scurfy, hilum sub-terminal, very short.

This species differs from *C. partita* in bearing non-circumscissile capsules, the form of scales, length of styles, etc. From *C. stenolepis*, which it also resembles, it differs in its acute calyx lobes, shape of scales, etc. This species is very distinctive with its reddish flowers and short scales and is one of the few with globular, deeply furrowed corollas.

Northern Peru.

Specimens examined.—PERU: 'Lagunitas, 6 miles east of Cape Parina' (*Haught 154*, the type, in the U. S. National Herb. as sheet 1,284,029).

28. **Cuscuta andina** Philippi

Cuscuta andina Philippi, Anal. Univ. Chili **90**: 224. 1895.
Cuscuta racemosa andina Reiche, Anal. Univ. Chile **120**: 819. 1907.

Stems medium. Flowers about 4 mm. long, fleshy, papillate, 4- or 5-parted, on pedicels about equal to, or exceeding, the length of the flower, in corymbose cymes?. Calyx shorter than the corolla tube, lobes triangular-acute, not overlapping at the base, but with the sinuses rounded and projecting so as to form a slight angle. Corolla lobes triangular-ovate, acute, tips often slightly inflexed, erect, about two-thirds the length of the cylindrical tube. Anthers oval and about equaling, or slightly exceeding, the slightly subulate filaments. Scales ovate, or triangular, about reaching the stamens, bridged below the middle, fringed with short processes. Styles about equaling the globose ovary, stigmas globose. The withered corolla enveloping the globose, not circumscissile, capsule; seeds 1.5–1.75 mm. long, hilum short, oblong.

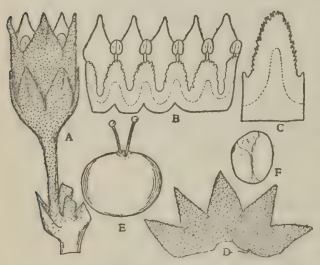

Fig. 28. C. andina.

This species in some respects resembles *C. suaveolens*, but is distinguished by its fleshy, distinctly papillate flowers with sharply acute lobes.

Specimens examined.—CHILI: Prov. Talca, on *Ephedra andina* (*Fr. Philippi*, the type, a specimen in the herbarium of the Botanical Institute at Dahlem). Known only from the type locality.

29. **Cuscuta globosa** Ridley

Cuscuta globosa Ridley, Jour. Linn. Soc. **27**: 48. 1890.—Yuncker, Am. Jour. Bot. **10**: 10. *pl. 5. f. 26a–e.* 1923.

Stems slender. Flowers mostly about 1.5 mm. long, 4- or, mostly, 5-parted, somewhat fleshy, on pedicels mostly exceeding the length of the flowers, in much branched, cymose clusters. Calyx about as deep as the corolla, lobes triangular-acute, frequently unequal, not overlapping. Corolla lobes triangular, acute, upright, or, commonly, inflexed over the ovary giving the flowers a globose appearance, about equal to the campanulate tube, Stamens mostly shorter than the lobes, slenderly subulate filaments much longer than the oval anthers. Scales reaching the stamens, ovate, moderately fringed with short processes, bridged below the middle. Styles often slightly subulate, longer then the globose ovary. Capsule depressed-globose, thin, not circumscissile; seeds commonly two in each capsule, about 1–1.25 mm. long, subglobose, flattened on one side, hilum small, withered corolla about the capsule towards its base, the capsule much exserted.

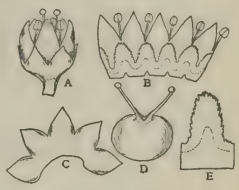

Fig. 29. C. globosa.

This species is closely related to *C. acuta* and also to *C. micrantha*, but differs from both of these species in the longer pedicels, smaller flowers, longer stamens, etc.

Specimens examined.—Island of Fernando de Noronha, summit of Morro Branco and near Tangle Bay (*Ridley, Lea and Ramage 72*, the type, in the Kew herbarium). Brazil: Pernambuco, on Malvaceae (*Pickel 906*).

30. **Cuscuta acuta** Engelmann

Cuscuta acuta Engelmann, Trans. Acad. Sci. St. Louis **1**: 497. 1859.—Yuncker, Am. Jour. Bot. **10**: 12. *pl. 2. f. 8a–e.* 1923.

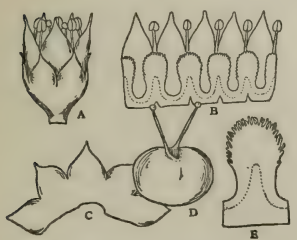

Fig. 30. C. acuta.

Stems slender. Flowers 2–3 mm. long, thin and membranous, on pedicels about as long as, or shorter than, the flowers, in umbellate clusters, Calyx campanulate, lobes triangular-ovate, acute to acuminate or somewhat cuspidate, as long as, or exceeding, the corolla tube. Corolla lobes ovate-lanceolate, acute to acuminate, upright or somewhat spreading in fruit, as long as, or longer than, the campanulate tube. Stamens about three-fourths as long

as the corolla lobes, filaments somewhat subulate, about equal to, or much longer than, the oval anthers. Scales reaching the stamens, thin, bridged below the middle, closely adherent to the tube, fringed about the upper half. Styles about equal to, or shorter than, the globose ovary, slightly subulate. Capsule not circumscissile, though very easily breaking away at the base, carrying the withered corolla about it, very thin and almost transparent in some specimens so that the seeds are visible in it, depressed-globose, intrastylar aperture comparatively large, styles upright or more often becoming divergent; seeds about 1 mm. long, ovate, hilum short, oblong.

This species differs from *C. pentagona* and *C. campestris*, with which it might be confused, in the shapes of the filaments, calyx and corolla lobes, the divergent styles and large intrastylar aperture.

Galapagos Islands. 'Mostly on Leguminosae, common on a low annual *Crotalaria*, but also on trees, such as *Parkinsonia* and Mimosae, hanging down in massy festoons.'

Specimens examined.—Galapagos Islands: Chatham Island (*Andersson*, the type, a specimen in the Kew herbarium); Tower Island (*Wheeler, Rose & Beebe 21*).

Subsection Californicae

The mostly pedicellate flowers all lack scales, with the exception of one form of *C. sandwichiana*. The corolla lobes are upright or reflexed, acute or obtuse.

KEY TO THE SPECIES

Flowers less than 2 mm. long, mostly 4-parted ..... 31. *C. insquamata*
Flowers larger (2–5 mm.) long, mostly 5-parted
  Corolla lobes triangular, about as broad as long, shorter than the tube
    Corolla more or less globular about the capsule ..... 32. *C. Jepsonii*
    Corolla campanulate ..... 33. *C. sandwichiana*
  Corolla lobes oblong, or mostly lanceolate, and reflexed
    Corolla lobes mostly shorter than the tube, calyx lobes very short (mostly less than half as long as the corolla tube) ..... 34. *C. brachycalyx*
    Corolla lobes longer than the corolla tube, calyx lobes longer
      Anthers oval, corolla lobes spreading, star-like in fruit, flowers sessile ..... 35. *C. occidentalis*
      Anthers linear, flowers pedicellate, corolla not star-shaped ... 36. *C. californica*

31. **Cuscuta insquamata** Yuncker

Cuscuta insquamata Yuncker, Am. Jour. Bot. **10**: 12. *pl. 5. f. 30a–d.* 1923.

Stems slender. Flowers 1.5–2 mm. long, delicate, mostly 4-parted, membranous, with a few, scattered, yellow, pellucid glands, on pedicels shorter, or longer, than the flowers, in cymose clusters. Calyx longer than the corolla tube, lobes triangular, acuminate. Corolla lobes upright, triangular, acuminate, about as long as the shallowly campanulate tube. Stamens shorter than the

lobes, ovate anthers about equal to the stout, subulate filaments. Scales lacking. Slender styles mostly shorter than the globose, somewhat pointed ovary which is slightly thickened at the top. Capsule with the withered corolla towards the base, globose, more or less depressed, with a fleshy collar about the intrastylar aperture, evidently not circumscissile, although a few capsules seemed to have a weaker zone at the base where they break loose when pulled; seeds four in each capsule, roundish, hilum small.

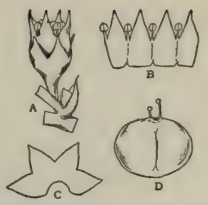

Fig. 31. C. insquamata.

This species closely resembles *C. umbellata* but differs in its shorter styles, lack of scales and by the capsule remaining closed at maturity.

Southern Bolivia.

Specimens examined.—BOLIVIA: Tareja, on Chenopodiaceae and Scrophulariaceae, alt. 2800 meters (*Fiebrig 3045*, the type, in the Museum of Natural History, Asunción, Paraguay).

32. **Cuscuta Jepsonii** Yuncker

Cuscuta Jepsonii Yuncker, Ill. Biol. Monogr. **6**: 149. *f. 52.* 1921.

Stems slender. Flowers 2–2.5 mm. long, 5-parted, on pedicels shorter than the flowers, in cymose clusters, entire inflorescence fleshy and papillate. Calyx lobes triangular, acute, scarcely reaching the middle of the corolla tube. Corolla globular, becoming urceolate, lobes upright, or more or less connivent, triangular, acute, less than half as long as the tube, not overlapping. Scales represented only by ridges and short bridges. Stamens much shorter than the corolla lobes; filaments about equal to the small, oval anthers. Styles more or less subulate, much shorter than the globose, slightly pointed ovary. Capsule depressed-globose, somewhat elevated about the intrastylar aperture, surrounded by the persistent corolla; seeds 2–4 in each capsule, rounded, compressed.

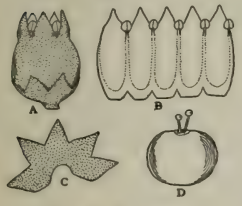

Fig. 32. C. Jepsonii.

This species resembles *C. occidentalis*, but differs from it in the possession of papillate flowers and shorter calyx and corolla lobes.

Northern California.

Specimens examined.—CALIFORNIA: Big Horse Mountain, South Fork of the Eel River (*Jepson 5c*, the type, in the University of California herbarium). Known only from the type locality.

33. **Cuscuta sandwichiana** Choisy

Cuscuta sandwichiana Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 280. *pl. 5. f. 4.* 1841; also in DC. Prodr. **9**: 458. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 496. 1859.

Stems slender to medium. Flowers 3–4 mm. long (infrequently 5 mm.), mostly 5-parted, often glandular, on pedicels mostly not longer than the flowers, in cymose clusters. Calyx about enclosing the corolla, lobes triangular-ovate, acute, or obtusish, in some flowers medianally thickened to form a slight carina. Corolla campanulate, early becoming globular about the developing capsule, thin, lobes ovate, or somewhat triangular in older flowers, acute or obtusish, nearly equaling the tube, upright, with inflexed tips. Stamens shorter than the lobes (not exceeding them as figured by Choisy), oblong anthers about equaling the stoutish and often subulate filaments. Scales lacking. Styles stoutish and about equaling the globose ovary, stigmas capitate. Withered corolla surrounding the globose, sometimes depressed and not circumscissile capsule, styles often divergent from a comparatively small intrastylar aperture; seeds about 2 mm. long, oblong, ovate, hilum oblong, perpendicular.

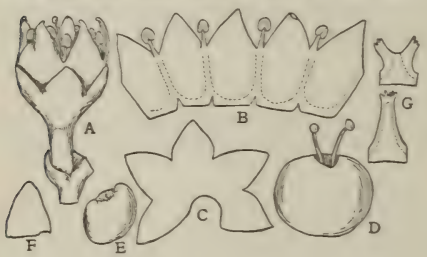

Fig. 33. A-F, C. sandwichiana; G. var. kailuana.

Hawaiian Islands.

Specimens examined.—Hawaiian Islands: (*Gaudichaud 1*, the type(?), in the DeCandolle herbarium; *37; Menzies; Mathews*); Oahu (*Remy 424; 426*); Honolulu (*Degener & Wiebke 2516*); Diamond Hill (*Maximowicz*); Maui, Wailuku (*Faurie 1045*).

Cuscuta sandwichiana kailuana n. var.

Pediculi saepe longiores quam flores. Scalae adsunt, bifidae, truncatae aut triangulares.

Flowers on pedicels often exceeding the flower length. Short, rather insignificant, yet definite, bifid, truncated or triangular scales present in the base of the corolla. Otherwise as in *C. sandwichiana*.

Hawaiian Islands.

Specimens examined.—Hawaiian Islands: (*Capt. Wilkes*); Hawaii, Kailua along beach on *Ipomoea Pes-caprae* (*Degener & Wiebke 2000*, the type, in the author's herbarium). The Wilkes' collection shows some corollas in which the scales are very small, or lacking, but in others they are easily distinguished; Oahu, Kaena Pt. (*Setchell*

15676); Molokai, near Moomomi on *Heliotropium curassavicum* (*Degener & Wiebke 2769*).

34. **Cuscuta brachycalyx** n. sp.

Cuscuta californica brachycalyx Yuncker, Ill. Biol. Monogr. **6**: 152. *f. 45e–f, 75.* 1921.

Flores 4 mm. longi, membranacei. Calyx turbinata, multo brevior quam corolla, lobis brevibus, late ovatis, acutis aut obtusis. Corolla campanulato-globosa, lobis oblongis, obtusis aut acutis, reflexis. Scalae nullae. Antherae ovati-lineares. Ovarium globosum. Styli longi, exserti. Capsula globosa.

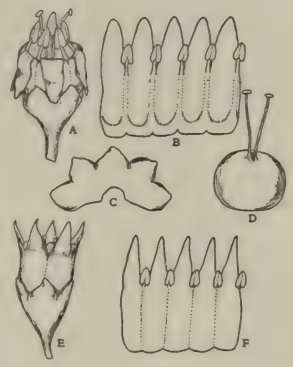

Fig. 34. A-D, C. brachycalyx; E-F, var. apodanthera.

Stems medium. Flowers about 4 mm. long, thin and semi-transparent, pedicellate, in loose clusters. Calyx turbinate, much shorter than the corolla, lobes short, broadly ovate, acute or obtuse. Corolla campanulate-globose, saccate between the stamen attachments, lobes reflexed, oblong, obtuse, or abruptly acute, shorter than or about equaling the tube. Scales lacking. Stamens shorter than the lobes, filaments subulate and somewhat shorter than the ovate-linear anthers. Ovary globose, styles long, exserted, stigmas globose or flattened. Capsule globose, multi-seeded, thin, surrounded by the withered corolla; seeds about 2 mm. long, globose, flattened on two surfaces, hilum short, oblong.

This species is closely related to *C. californica*, but differs by its very short calyx and more obtuse perianth lobes.

California. Often on *Eriogonum.*

Type.—Near Hanford, California (*Kearney 52*, in the herbarium of the New York Botanical Garden).

Cuscuta brachycalyx apodanthera n. comb.

Cuscuta californica apodanthera Yuncker, Ill. Biol. Monogr. **6**: 152. 1921.

Flowers on slender pedicels forming loose clusters. Calyx much shorter than the tube, lobes triangular-ovate, acute. Corolla very thin and transparent, lobes lanceolate, acute, shorter than the tube. Anthers linear-ovate, subsessile or on slender filaments which are shorter than the anthers.

This variety closely resembles *C. californica* in many of its characters but differs principally in its sessile or short-stalked anthers, shorter corolla

lobes and more transparent flower parts. From *C. brachycalyx* it differs in its shorter filaments and mostly shorter styles.

California. Often on *Eriogonum*.

Type.—Yosemite Valley, California (*Jepson 80a*, in the University of California herbarium).

35. **Cuscuta occidentalis** Millspaugh

Cuscuta occidentalis Millspaugh, in Millspaugh & Nuttall, Fl. Santa Catalina Isl. Field Mus. Nat. Hist. Bot. **5**: 204. 1923.

Cuscuta californica breviflora Engelmann, Trans. Acad. Sci. St. Louis **1**: 499. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 151. *f. 45d, 77*. 1921.

Stems medium. Flowers about 3 mm. long, often glandular, mostly sessile in small, compact clusters. Calyx as long as, or longer than, the corolla tube, lobes ovate-lanceolate, acuminate, fleshy and thickened at the base (turbinate)

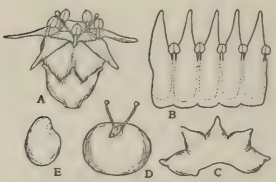

Fig. 35. C. occidentalis.

Corolla globose, saccate between the stamen attachments, becoming globular about the developing capsule, lobes lanceolate, acuminate, spreading in fruit, giving a characteristic star-shape to the flower when viewed from above. Stamens shorter than the lobes, anthers oval, filaments subulate. Scales lacking. Styles longer than the globose ovary, but not as long and exserted as in *C. californica*, stigmas small, globose. Capsule globose, surrounded by the withered corolla; seeds about 1.5 mm. long, oval, flattened on two surfaces, hilum short.

This species differs from *C. californica*, with which it is closely allied, in the characteristic appearance of the sessile flowers and its short anthers and styles.

Pacific coast states and inland to western Colorado. On various hosts, as *Solanum*, *Grindelia*, etc.

Type.—Monterey, California (*Hartweg 1863*).

36. **Cuscuta californica** Choisy

Cuscuta californica Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 279. 1841; also in DC. Prodr. **9**: 457. 1845.—Cottage Gard. **20**: 9. *f. 1*. 1858; **44**: 269. *f. 1*. 1870.—Yuncker, Ill. Biol. Monogr. **6**: 150. *f. 45a–e, 74, 84, 151*. 1921.

Cuscuta acuminata Nuttall in the herb. Acad. Sci. Phil., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 498. 1859. Not Pomel.

Cuscuta californica graciliflora Engelmann, Trans. Acad. Sci. St. Louis **1**: 499. 1859.

Cuscuta californica longiloba Engelmann, Trans. Acad. Sci. St. Louis **1**: 499. 1859.

Stems medium. Flowers 3–5 mm. long, on short pedicels, forming loose, cymose-paniculate clusters. Calyx somewhat shorter than, or often exceeding, the corolla tube, lobes triangular to lanceolate, acute to acuminate, overlapping, turbinate, base fleshy. Corolla campanulate-cylindric, often saccate between the stamen attachments, lobes narrow, lanceolate, acute, reflexed, longer than the tube. Before the flower opens the corolla lobes are erect and connivent, which, with the spreading or reflexed calyx lobes, produces a pointed bud of unique appearance. Scales lacking, represented by ridges which form inverted arches between the stamens. Stamens shorter than the lobes, anthers more or less subulate and about equal to the oblong-linear, or oval, anthers. Styles much longer than the globose ovary, stigmas globose. The withered corolla enveloping the globose, not circumscissile capsule.

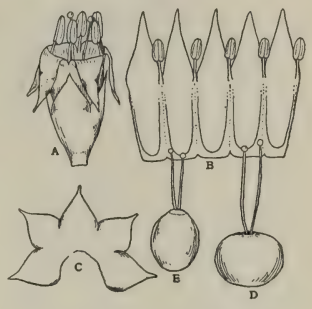

Fig. 36. A-D, C. californica; E, var. apiculata.

Pacific coast states from Washington to lower California, on *Franseria*, *Eriogonum*, *Foeniculum*, *Abronia*, *Asclepias*, *Adenostoma*, etc.

Type.—'Nov. Californiam' (*Douglas*). Not seen.

Cuscuta californica papillosa Yuncker

Cuscuta californica papillosa Yuncker, Ill. Biol. Monogr. **6**: 152. *f. 76*. 1921.

Flowers and pedicels densely papillate. Otherwise similar to *C. californica*. California.

Type.—San Bernardino Valley, California (*Parish 5524*, in the Rocky Mountain Herbarium of the University of Wyoming).

Cuscuta californica apiculata Engelmann

Cuscuta californica apiculata Engelmann, Trans. Acad. Sci. St. Louis **1**: 499. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 152. *f. 45g*. 1921.

Corolla granulate, ovary ovoid-pointed. Otherwise similar to *C. californica*.

Type.—California, 'On the Colorado' (*Bigelow* in 1854, a specimen in the herbarium of the Missouri Botanical Garden). Known only from the type locality.

Subsection Indecorae

Flowers more or less fleshy, papillate or glandular, corolla lobes acute or obtusish, tips often inflexed. Capsule with a thickened stylopodium, globose or globose-depressed.

KEY TO THE SPECIES

Flowers reddish, glandular, somewhat fleshy, calyx lobes obtuse, or acutish, scales narrowly oblong.....37. *C. stenolepis*

Flowers more fleshy, papillate or granulate, calyx lobes acute, or infrequently obtusish, flowers ordinarily not reddish

Scales mostly prominent, flowers ordinarily more than 2 mm. long, mostly 5-parted 38. *C. indecora*

Scales reduced, winged or toothed ridges, flowers about 2 mm. long, mostly 4-parted 39. *C. Coryli*

37. **Cuscuta stenolepis** Engelmann

Cuscuta stenolepis Engelmann, Trans. Acad. Sci. St. Louis **1**: 503. 1859.—Yuncker, Am. Jour. Bot. **10**: 7. *pl. 5. f. 31a–e.* 1923.

Stems slender, densely matted. Flowers few and scattered, about 2-3 mm. long, on pedicels mostly about equaling, or sometimes longer or shorter than, the yellowish, or reddish, glandular flowers, in scattered, few-flowered, paniculate, or cymose clusters. Calyx deeply divided, lobes not overlapping, reaching the middle of the corolla tube, or higher, ovate, obtuse, or acutish. Corolla lobes about half or three-fourths as long as the sub-cylindrical tube, oblong-ovate, acute, or more or less obtuse, reflexed, with inflexed tips. Stamens shorter than the lobes, filaments equal to, or shorter than, the oval anthers. Scales nearly reaching the stamens, bridged at a third or a quarter of their height, narrow, sparingly fringed with a few scattered processes. Styles slender, about equal to the globose, apiculate ovary. Capsule globose, or conic, with knobs about the base of the styles, with the withered corolla about it or at the top as a hood; seeds subglobose, about 1.5 mm. long.

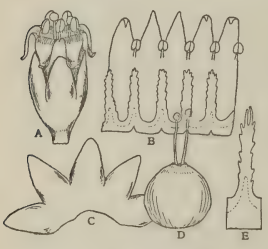

Fig. 37. C. stenolepsis.

Ecuador.

Specimens examined.—Ecuador: Andes of Quito (*Hall* in 1853, the type, in the herbarium of the Botanical Institute at Dahlem; *Couthouy* in 1855; *Stübel 3; Sodiro 113/10; 113/11; E.W.D. & Mary M. Holway* in 1920); Otavalo, on *Hedyotis ericoides* (*Holmgren 908*); Pichincha (*Holmgren 908a*).

38. **Cuscuta indecora** Choisy

Cuscuta indecora Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 278. *pl. 3 f. 3.* 1841; also in DC. Prodr. **9**: 457. 1845.—Yuncker, Ill. Biol. Monogr. **6**: 147. 1921.—Smiley, Monthly Bull. Dept. Agr. Calif. **11**: 131. *f. 44a–b.* 1922.

Cuscuta verrucosa hispidula Engelmann, Am. Jour. Sci. & Arts **43**: 341. 1842.

Cuscuta hispidula Engelmann, Am. Jour. Sci. & Arts **45**: 75. 1843.
Cuscuta neuropetala minor Engelmann, Bost. Jour. Nat. Hist. **5**: 223. 1845.
Cuscuta porphyrostigma Engelmann, Bost. Jour. Nat. Hist. **5**: 223. 1845, in synon.
Cuscuta decora Engelmann, Trans. Acad. Sci. St. Louis **1**: 501. 1859.
Cuscuta decora indecora Engelmann, Trans. Acad. Sci. St. Louis **1**: 502. 1859.
Cuscuta parviflora vestita Progel in Martius, Fl. Bras. **7**: 386. 1871.
Epithymum indecorum (Choisy) Nieuwland & Lunell, Am. Midl. Nat. **4**: 511. 1916.
Cuscuta indecora hispidula (Engelmann) Yuncker, Ill. Biol. Monogr. **6**: 148. 1921.

Stems medium to coarse. Flowers 2–2.5 mm. long, whitish, fleshy, papillose-hispid, on pedicels longer than the flowers. Calyx lobes triangular-ovate, acute, or somewhat obtuse, shorter than the corolla tube. Corolla campanuate, lobes erect to spreading, triangular, acute, with inflexed tips. Scales as long as, or longer than, the corolla tube, ovate or somewhat spatulate, deeply fringed, bridged at, or below, the middle. Stamens shorter than the lobes, anthers broad, oval, about equal to the filaments. Styles as long as, or slightly longer than, the globose, pointed ovary, becoming divaricate in fruit. Capsule globose, thickened at the top enveloped by the withered corolla; seeds about 1.7 mm. long, usually two to four in a capsule, roundish or broader than long, somewhat scurfy, hilum small, oval, transverse, or somewhat oblique.

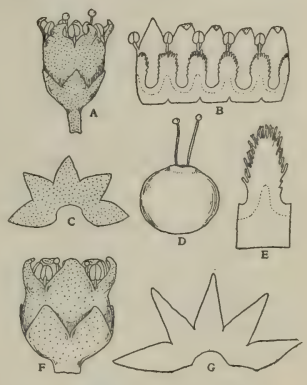

Fig. 38. A-E, C. indecora; F, var. neuropetala; G, var. longisepala.

Texas, New Mexico, Mexico and in the West Indies.

Type.—'Mexicum ad Metamoros' (*Berlandier 2285*, in the DeCandolle herbarium).

Cuscuta indecora neuropetala (Engelm.) Hitchcock

Cuscuta indecora neuropetala (Engelm.) Hitchcock, Contrib. U. S. Nat. Herb. **3**: 549. 1896.—Matthew, Bull. Torrey Club **20**: *pl. 164. f. 4*. 1893.—Britton & Brown, Illust. Flora **3**: 29. *f. 2960*. 1898; 2d ed., **3**: 50. *f. 3446*. 1913.—Stevens, Am. Jour. Bot. **3**: 185. *f. 3, 4*. 1916.—Robbins & Egginton, Col. Agr. Exp. Sta. Bull. 248: *f. 4, 6, 7*. 1918.—Yuncker, Ill. Biol. Monogr. **6**: 142. *f. 44a–e, 96, 128*. 1921; Am. Jour. Bot. **10**: 9. 1923.
Cuscuta neuropetala Engelmann, Am. Jour. Sci. & Arts **45**: 75. 1843.
Cuscuta neuropetala littoralis Engelmann, Bost. Jour. Nat. Hist. **5**: 223. 1845.
Cuscuta pulcherrima Scheele, Linnaea **21**: 750. 1848.
Cuscuta decora pulcherrima Engelmann, Trans. Acad. Sci. St. Louis **1**: 502. 1859.

Cuscuta decora subnuda Engelmann, Trans. Acad. Sci. St. Louis **1**: 502. 1859.
Cuscuta indecora portoricensis Urban, Symb. Ant. **4**: 502. 1910.
Cuscuta indecora subnuda Yuncker, Am. Jour. Bot. **10**: 9. 1923.

Flowers mostly larger than for *C. indecora* (2–5 mm.), loose or compacted, corolla broadly campanulate, varying in its degree of papillation. Calyx lobes shorter than, or equaling, the corolla tube. (The proportion of the calyx and corolla lobes is quite variable.)

This is the most common of the various forms of *C. indecora*. It is usually a very attractive species and Engelmann considered the name *decora* to be more appropriate than Choisy's *indecora*.

Illinois and westward to Utah and California, southward into Mexico and through the southern states to the West Indies and in South America. On a great variety of hosts as *Artemisia, Cleome, Liatris, Solidago, Helianthus, Rudbeckia, Myrica, Salsola, Ambrosia, Acacia, Medicago, Amsonia,* etc.

Type.—'Texas in wet prairies near Houston' (*Lindheimer 124*, a specimen in the herbarium of the Missouri Botanical Garden).

Cuscuta indecora longisepala Yuncker

Cuscuta indecora longisepala Yuncker, Ill. Biol. Monogr. **6**: 149. *f. 47f, 97*. 1921; Am. Jour. Bot. **10**: 10. 1923.

Flowers subsessile, or on pedicels exceeding the flowers in some specimens. Calyx lobes lanceolate, acuminate, as long as, or exceeding, the corolla tube. Intermediate forms connecting this with variety *neuropetala* are not uncommon.

Southwestern United States, Mexico and South America.

Type.—On the Blanco, Texas (*Wright*, a specimen in the herbarium of the Missouri Botanical Garden).

Cuscuta indecora integriuscula (Engelmann) Yuncker

Cuscuta indecora integriuscula (Engelmann) Yuncker, Am. Jour. Bot. **10**: 10. 1923.
Cuscuta decora integriuscula Engelmann, Trans. Acad. Sci. St. Louis **1**: 502. 1859.

Flowers finely granulated. Scales shallowly fringed, triangular, reaching the stamens, bridged at about the middle. Styles very slender, shorter than the ovary. Calyx lobes triangular, acute, about equal to the corolla tube. Capsule thinner than is general in the species.

Specimens examined.—ARGENTINA: Mendoza (*Gillies*, a specimen in the herbarium of the Missouri Botanical Garden). Known only from the type locality.

Cuscuta indecora bifida Yuncker

Cuscuta indecora bifida Yuncker, Ill. Biol. Monogr. **6**: 149. 1921; Am. Jour. Bot. **10**: 10. 1923.

This variety is characterized by having bifid scales. In its other characteristics it closely resembles variety *neuropetala*.

Throughout the range of variety *neuropetala*, but not common.

Type.—Twin Springs, Nevada (*Purpus*, in the herbarium of the University of California).

39. Cuscuta Coryli Engelmann

Cuscuta Coryli Engelmann, Am. Jour. Sci. & Arts **43**: 337. *pl. 6. f. 7–11.* 1842.—Matthew, Bull. Torrey Club **20**: *pl. 164. f. 5.* 1893.—Britton & Brown, Illust. Flora **3**: 29. *f. 2961.* 1898; 2d ed. **3**: 50. *f. 3447.* 1913.—Stevens, Am. Jour. Bot. **3**: 185. *f. 1, 2, 9, 10.* 1916.—Yuncker, Ill. Biol. Monogr. **6**: 145. *f. 42, 55, 56, 130.* 1921; Proc. Ind. Acad. Sci. **1919**: 160. *f. 3.* 1921.

Cuscuta Coryli stylosa Engelmann, Am. Jour. Sci. & Arts **43**: 337. 1842.

Cuscuta crenulata Engelmann, London Jour. Bot. **2**: 197. 1843.

Cuscuta compacta crenulata Choisy in DC. Prodr. **9**: 459. 1845.

Cuscuta inflexa Engelmann, Trans. Acad. Sci. St. Louis **1**: 502. 1859.

Cuscuta congesta Beyrich, in herb. Not Bentham.

Cuscuta parviflora Nuttall, in herb. Not Willdenow nor Engelmann.

Cuscuta umbrosa Beyrich, in herb. in part. Not Hooker.

Epithymum Coryli (Engelmann) Nieuwland & Lunell, Am. Midl. Nat. **4**: 511. 1916.

Stems medium to slender. Flowers fleshy, papillate, about 2 mm. long, 4- or 5-parted (commonly 4-parted), on pedicels shorter, or longer, than the flowers, in panicled cymes (sometimes endogenously formed). Calyx lobes triangular, acute, equaling, or longer than, the corolla tube. Corolla cylindric-campanulate, lobes triangular-ovate, crenulate, upright, with acute, inflexed tips. Scales rudimentary, bifid, toothed, ordinarily reduced to toothed wings on either side of the filament attachment, bridged somewhat below the middle. Stamens nearly as long as the lobes, anthers oval to slightly oblong, on somewhat subulate filaments. Ovary globose-ovoid, thickened at the top, styles more or less subulate, shorter than, or equal to, the ovary, becoming widely divergent on the capsule. Capsule at first globose, becoming depressed, thickening in a collar about the intrastylar aperture, the withered corolla about the upper part or soon falling away; seeds about 1.5 mm. long, usually four in each capsule, dark brown, globular, or somewhat compressed, rather oblique, the surface scurfy, hilum short, oblong, oblique or transverse.

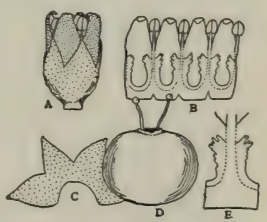

Fig. 39. C. Coryli.

This species is closely related to *C. indecora*, but is distinguished by its often 4-parted flowers which are commonly smaller, rudimentary scales, and shape of fruit.

Throughout the United States east of the Rocky mountains, but less common southward and westward. On many different woody and herbaceous hosts as *Corylus*,

Solidago, Ceanothus, Symphoricarpus, Salix, Carya, Rhus, Helianthus, Stachys, Chrysanthemum, etc. Brenckle and Stevens report it as 'quite destructive in a small field of flax' at Fort Ransom, N. Dakota.

Type.—In dry prairies near St. Louis (*Engelmann* in 1841, in the herbarium of the Missouri Botanical Garden).

Subsection Subinclusae

Capsules mostly 1-seeded (more in *C. Suksdorfii* and forms of *C. micrantha*), mostly ovoid or conic. Perianth lobes acute, scales mostly narrow, or reduced. Principally in the Pacific coast region of North and South America.

KEY TO THE SPECIES

Calyx shorter than the corolla tube, flowers about 5 mm. long, calyx lobes overlapping ..... 40. *C. subinclusa*

Calyx as long as, or longer than the corolla tube, flowers mostly smaller, calyx lobes not especially overlapping

Calyx and corolla lobes long, attenuated at the tip, scales reduced to lateral, dentate wings, capsule 2–4 seeded ..... 41. *C. Suksdorfii*

Calyx and corolla lobes mostly not long, or attenuated, scales narrow or broader, but not reduced to wings, capsules mostly 1-seeded

Scales shorter than the tube ..... 42. *C. salina*

Scales about reaching the stamens ..... 43. *C. micrantha*

40. **Cuscuta subinclusa** Durand & Hilgard

Cuscuta subinclusa Durand & Hilgard, Jour. Acad. Nat. Sci. Phil. II. **3**: 42. 1855; Pacific R.R. Report 5^3: 11. 1855.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 500. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 159. *f. 47, 73, 147.* 1921.

?Cuscuta Ceanothi Behr, Proc. Calif. Acad. Nat. Sci. **1**: 16. 1854.

Stems medium, somewhat fleshy in some specimens. Flowers about 5–6 mm. long, 5-parted, sessile, or on pedicels shorter than the flowers, in few- to several-flowered clusters which may be either scattered or approximated into dense, continuous masses. Calyx less than, or sometimes more than, half as long as the corolla tube, lobes broadly ovate to lanceolate, acute, sometimes cuspidate, overlapping, somewhat loose about the corolla. Corolla cylindrical, usually showing horizontal ridges between the stamen attachments in the dried flowers, slightly fleshy, the cells somewhat lens shaped, causing the edges of the lobes to be crenulate, lobes slightly overlapping, ovate, acute,

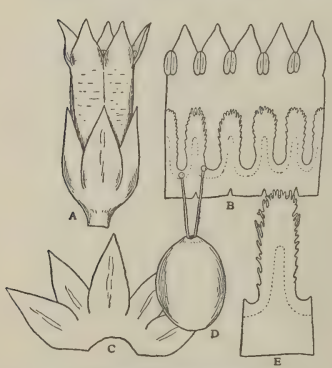

Fig. 40. C. subinclusa.

erect to spreading, much shorter than the tube. Scales oblong, about half as long as the tube, fringed with short processes, bridged at about one-third of their height. Anthers oblong, subsessile or sessile. Styles slender, much longer than the sub-globose or conic ovary. Capsule oval, pointed, thickened in the form of a collar about the intrastylar aperture, capped by the withered corolla; seeds about 1.8 mm. long, usually but one in each capsule, globose, slightly compressed, hilum situated at the broader end in a depression, short, oblong, oblique.

Pacific coast states from Oregon to Mexico. On *Salix, Sambucus, Grindelia, Artemisia, Crataegus, Baccharis, Rhus,* etc.

Type.—'On a willow, Tejon Pass,' California (*Heermann*). Not seen.

41. Cuscuta Suksdorfii n. sp.

Cuscuta salina acuminata Yuncker, Ill. Biol. Monogr. 6: 162. *f. 32f–g, 89.* 1921.

Caules tenues. Flores 3 mm. longi. Periantho 4 aut 5 fisso. Calycis lobi ovati cum apicibus longe attenuatis, longiores quam corollae tubus. Corollae lobi triangulari-ovati cum apicibus elongatis. Filamenta subulata. Scalae oblongae, breviores quam tubus. Styli tenues brevioresque quam ovarium conicum.

Stems slender. Flowers about 3 mm. long, 4- or 5-parted, on pedicels mostly shorter than the flowers, or sometimes longer, in few-flowered, umbellate clusters. Calyx enclosing the corolla, lobes ovate, with long, attenuated points which reach to the middle of the corolla lobes. Corolla lobes triangular-ovate, with long, lanceolate tips, longer than the campanulate tube, erect. Stamens shorter than the lobes, filaments subulate and longer than the oval anthers. Scales oblong, shorter than the tube, represented by two, shallowly dentated wings. Stigmas capitate, styles slender or stoutish and much shorter than the conic ovary. Capsule glandular, ovoid-conic, very thin, intrastylar opening large, withered corolla about the lower half; seeds about 1 mm. long, globose, 2–4 in a capsule, hilum oblong.

Fig. 41. C. Suksdorfii.

This species is closely allied with *C. salina* with which it differs in the shape of the perianth lobes; calyx lobes not overlapping; corolla about the lower part of the protruding capsule; mostly very short styles; small more or less bifid scales; and multiseeded capsules.

Washington and ?Oregon.

Specimens examined.—WASHINGTON: Skamania County, on an island of a mountain lake, on *Aster* (*Suksdorf 1487*, the type, in the U. S. National Herbarium, as

sheet No. 49,803).—Oregon: McGribble Ranger Station, 10 miles southeast of Port Oxford (*Peck 8624?*).

42. **Cuscuta salina** Engelmann

Cuscuta salina Engelmann in Brewer, Watson & Gray, Bot. of Calif. Geol. Survey Publ. **1**: 536. 1876.—Yuncker, Ill. Biol. Monogr. **6**: 160. 1921.
Cuscuta californica squamigera Engelmann, Trans. Acad. Sci. St. Louis **1**: 499. 1859.
Cuscuta subinclusa abbreviata Engelmann, Trans. Acad. Sci. St. Louis **1**: 500. 1859.
Cuscuta squamigera (Engelmann) Piper, Contrib. U. S. Nat. Herb. **11**: 455. 1906.
Cuscuta salina squamigera Yuncker, Ill. Biol. Monogr. **6**: 161. *f. 126*. 1921.

Stems very slender. Flowers 2–3 mm. long, 5-parted, on pedicels mostly shorter than the flowers, in umbellate-cymose clusters. Calyx lobes ovate-lanceolate, acute to acuminate, about as long as the corolla tube. Corolla lobes about as long as the campanulate or somewhat cylindrical tube, ovate-lanceolate, sometimes granulate, acute to acuminate, upright or sometimes spreading, edges frequently uneven, more or less overlapping. Scales narrow, oblong, shorter than the tube, fringed with short processes, closely attached to the tube for nearly their entire length, bridged below the middle. Filaments subulate and about equal to, or shorter than, the oval anthers. Styles slender or slightly subulate, shorter than, or about equaling, the globose, pointed ovary. Capsule globose, pointed, usually one-seeded, surrounded or capped by the withered corolla; seeds about 1.5 mm. long, globose-ovoid, more or less rostrate, hilum short, oval, transverse.

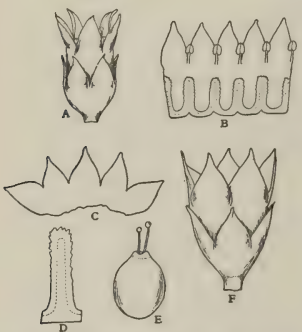

Fig. 42. A-E, C. salina; F, var. major.

British Columbia to California, Utah, Arizona and, possibly, Mexico. On *Cressa, Nitrophila, Frankenia, Suaeda, Salicornia,* etc. The northern forms have less granulate corollas.

Type.—'Saline soil on the Rio Virgen, Utah, on *Suaeda*' (*Remy*, in the herbarium of the Missouri Botanical Garden).

Cuscuta salina major Yuncker

Cuscuta salina major Yuncker, Ill. Biol. Monogr. **6**: 161. *f. 32a–e, 121, 140*. 1921.

Flowers 3–4.5 mm. long, broadly campanulate, more membranous than in *C. salina*, lobes broadly ovate, acute, overlapping. Scales mostly narrow, oblong, with few teeth. Intermediates uniting this with *C. salina* are not uncommon.

British Columbia to California, mostly on *Salicornia.*

Type.—Palo Alto, California (*Baker 41*, in the herbarium of the New York Botanical Garden).

Cuscuta salina apoda n. comb.

Cuscuta Veatchii apoda Yuncker, Ill. Biol. Monogr. **6**: 159. *f. 48f.* 1921.
Cuscuta nevadensis Johnston, Proc. Calif. Acad. Sci. IV. **12**: 1133. 1924.

Flowers 3–4 mm. long. Lobes of calyx and corolla more lanceolate than in *C. salina* and also somewhat longer. Scales mostly broader and commonly free. Anthers oval-oblong, subsessile.

I formerly united this with *C. Veatchii* as variety *apoda*, but I now believe, as Johnston has already pointed out, that it is more closely allied with *C. salina*, and, in fact, some specimens are intermediate with that species.

Nevada and Arizona. On *Atriplex*, etc.

Type.—Las Vegas, Nevada (*Wooton* in 1916, in the U. S. National Herb. as sheet 768,922).

43. **Cuscuta micrantha** Choisy

Cuscuta micrantha Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 271. *pl. 1. f. 3.* 1841; also in DC. Prodr. **9**: 453. 1845.—Gay, Hist. de Chile **4**: 446. 1849.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 500. 1859.—Reiche, Fl. Chile **5**: 171. 1910.
?Cuscuta pauciflora Philippi, Linnaea **33**: 185. 1864.
Cuscuta sparsiflora Philippi in herb., ex Reiche, Fl. Chile **5**: 171. 1910.
Cuscuta micrantha typica Yuncker, Am. Jour. Bot. **10**: 11. *pl. 1. f. 2a–e.* 1923.

Stems slender. Flowers about 2 mm. long, on pedicels shorter than the flowers, in rather dense, compact clusters. Calyx about as long as the corolla tube, lobes ovate, acute. Corolla lobes ovate, acute, upright or slightly spreading, mostly shorter than the campanulate tube. Scales narrow, oblong, sparingly fringed about the top with few processes, bridged at about a quarter of their height, reaching the stamens. Stamens shorter than the lobes, filaments shorter than, or exceeding, the length of the ovate-cordate anthers, slender or slightly subulate. Styles slender and mostly shorter than the ovoid or conic ovary. Capsule ovoid, mostly one-seeded.

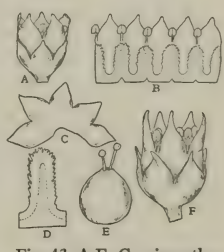

Fig. 43. A-E, C. micrantha; F, var. Holwayi.

Chile. On *Frankenia*, etc.

Specimens examined.—Chile: Prov. Coquimbo (*Gay 538*, the type?, a specimen in the herbarium of the Missouri Botanical Garden); Santiago, alt. 3000 meters (*Reiche III, 99*, the type? of *C. sparsiflora* in the herbarium of the Botanical Institute at Dahlem).

Cuscuta micrantha latiflora Engelmann

Cuscuta micrantha latiflora Engelmann, Trans. Acad. Sci. St. Louis **1**: 501. 1859.—Yuncker, Am. Jour. Bot. **10**: 11. *pl. 1. f. 2f–g.* 1923.

Cuscuta popayanensis Poeppig in herb. Not H.B.K.

Flowers 2.5–3 mm. long, corolla lobes about equal to the tube. Anthers oval and larger than in *C. micrantha*. Scales somewhat larger. Styles shorter than the ovoid or globose ovary. Intermediate forms connecting this variety with *C. micrantha* are not uncommon.

Chile. On *Plantago, Trifolium, Laretia,* etc.

Specimens examined.—Chile: (*v. Better 142; Reed*); Concon (*Poeppig 89*, the type, a specimen in the herbarium of the Missouri Botanical Garden); Desert of Atacama (*Morong 1163*); San Jago (*Hohenacker 489*); Prov. Atacama, Dept. Copiapo, alt. 200 meters (*Werdermann 464*, this has large flowers with more elongated corolla lobes, but otherwise appears to belong here).

Cuscuta micrantha Holwayi n. var.

Flores circ. 3 mm. longi. Calycis lobi plerumque ovati-lanceolati, acuti usque acuminati. Scalae exsertae. Styli tenues, longiores quam ovarium globosum.

Flowers about 3 mm. long. Calyx lobes mostly ovate-lanceolate, acute or acuminate. Scales exserted, prominently fringed. Styles slender and longer than the globose ovary. Capsule globose-depressed, 1–4 seeded.

Chile.

Specimens examined.—Chile: Panamavida (*E.W.D. & Mary M. Holway* Dec. 17, 1919, the type, in the author's herbarium; Dec. 18, 1919); Cerro Blanco (*Hastings 154*); Valparaiso (*Brenning 91*).

Subsection Denticulatae

Flowers small, on short pedicels, or sessile. Perianth lobes denticulate, or entire. Capsules 1-seeded, embryo with a thickened, terminal knob, endosperm lacking?.

KEY TO THE SPECIES

Calyx lobes acute ..... 44. *C. Veatchii*
Calyx lobes obtuse
Perianth segments denticulate, orbicular, broadly overlapping .... 45. *C. denticulata*
Perianth segments not denticulate, ovate, scarcely overlapping, styles nearly lacking 46. *C. microstyla*

44. Cuscuta Veatchii Brandegee

Cuscuta Veatchii Brandegee, Proc. Calif. Acad. Sci. II. **2**: 189. 1889.—Johnston, Proc. Calif. Acad. Sci. IV. **12**: 1132. 1924.

Cuscuta Veatchii typica Yuncker, Ill. Biol. Monogr. **6**: 159. *f. 48a–e, 60.* 1921.

Stems medium to slender. Flowers about 2–3 mm. long, on pedicels shorter than the flowers, single or in clusters of two to five, forming small, lateral umbels. Calyx membranous, longer than the corolla tube, lobes ovate or oval, overlapping, acute, more or less denticulate. Corolla lobes ovate and acute, edges denticulate, as long as the campanulate tube, slightly overlapping, spreading. Scales reaching the anthers, fringed with medium length processes, bridged at about the middle. Stamens on filaments about equaling the oval anthers. Styles about as long as the globose-ovoid ovary, stigmas capitate. Capsule globose-ovoid, carrying the withered corolla at the top; seeds usually but one in each capsule, roundish, hilum terminal, embryo with a large round knob at one end.

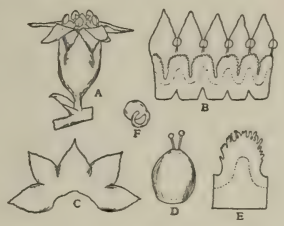

Fig. 44. C. Veatchii (F, embryo).

Lower California on *Veatchia* trees.

Specimens examined.—Mexico: Lower California, Santa Maria (*Brandegee* in 1889); Ubi (*Brandegee* in 1889, the type, in the herbarium of the University of California, as sheet 105,066); San Roquis (*Brandegee* in 1889); Los Angeles Bay (*Johnston 3430; 3439*).

45. **Cuscuta denticulata** Engelmann

Cuscuta denticulata Engelmann, Am. Nat. **9**: 348. 1875.—Hillman, Nev. Agr. Exp. Sta. Bull. 15: *f. 5*. 1892.—Yuncker, Ill. Biol. Monogr. **6**: 158. *f. 46, 83, 146*. 1921.

Stems very slender. Flowers about 2 mm. long, subsessile, in shortened, more or less bracteate, inflorescences of few flowers, the bracts often one to three, ovate-lanceolate, acute. Calyx lobes orbicular, obtuse, denticulate, deeply divided, overlapping, enclosing the corolla tube. Corolla campanulate, becoming urceolate in fruit, lobes ovate or oval, somewhat overlapping, spreading, about equaling the tube. Scales denticulate, about reaching the anthers, oblong-ovate, bridged at about the middle, or below. Anthers oval, shorter than the corolla lobes, about equal to the filaments. Styles shorter than the small conic ovary, stigmas small, globose. Capsule conic, bearing the withered corolla about the top, mostly one-seeded; seeds about 1 mm. long, globose-ovoid, hilum small, embryo with an enlarged, round, terminal knob.

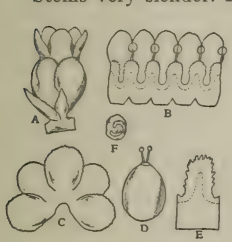

Fig. 45. C. denticulata (F, embryo).

Utah, Nevada, and California. On *Hymenoclea, Gutterrizia, Covillea, Ericameria, Bigelovia, Coleogyne, Biscutella*, etc.

Specimens examined.—Utah: St. George (*Parry 205*, the type, in the herbarium of the Missouri Botanical Garden).—Nevada: Lyon County, Smith Valley (*Wilson 4596*); Esmeralda County (*Schockley 443*); Reno (*Curran* in 1888; *Hillman* in 1891); Pyramid Lake (*Curran* in 1883).—California. The Needles (*Jones 3862;* in 1884; *Rose 12074*); San Bernardino Mts., alt. 2500 ft. (*Parish 2336; 2436; 3230; 3231; 3236*); Mojave desert, Tehachapi Pass (*Abrams & McGregor 505*); Palmdale (*Abrams & McGregor 522*); San Diego County (*Orcutt* in 1889; in 1898); Barstow (*Brandegee* in 1909); Pass 15 miles from Amboy (*Munz, Harwood & Johnston 4181*); Los Angeles County, Ravenna (*Brandegee*). I formerly listed the *Jones 3862* and *Orcutt* in 1889 collections with *C. Veatchii*. They more properly belong here, however, although they approach *C. Veatchii* in their deltoid, acutish calyx lobes.

46. **Cuscuta microstyla** Engelmann

Cuscuta microstyla Engelmann, Trans. Acad. Sci. St. Louis **1**: 506. 1859.—not Yuncker, Am. Jour. Bot. **9**: 561. 1922.

Stems medium. Flowers about 2.5–3 mm. long, glandular, more or less fleshy, subsessile in few-flowered (3 flowers most seen), cymose clusters. Calyx shorter than the tube, lobes triangular-ovate, obtuse, scarcely, if at all, overlapping. Corolla lobes ovate, obtuse or acutish, equaling the campanulate-globose tube, spreading. Scales spatulate, fringed with short processes, closely adherent to the tube, reaching the stamens. Stamens shorter than the lobes, anthers oval and about equal to the filaments. Ovary pointed-globose, projecting from the corolla, styles nearly lacking, stigmas more or less flattened. Capsule not seen, but the ovary indicates that it would not be circumscissile and would carry the withered corolla about it.

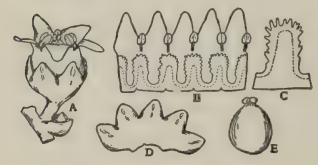

Fig. 46. C. microstyla.

I originally confounded this species with a specimen collected by Fries in Argentina. Examination of Engelmann's type at Kew, however, clearly indicates that the Fries collection represents a separate and distinct species with circumscissile fruit (*C. Friesii*).

Specimens examined.—'On the volcano of Antuco, Chili' (*Reynolds 95*, the type, in the Kew herbarium). Known only from the type locality.

Subsection Oxycarpae

Subsection *Oxycarpae* Engelmann, Trans. Acad. Sci. St. Louis **1**: 499. 1859, in part.

Engelmann made his subsection *Oxycarpae* to include all those species with the ovary and capsule thickened at the top. I have retained the subsectional name only for those species with the top of the ovary strikingly thickened. Flowers comparatively large, pedicellate, perianth lobes, obtuse.

KEY TO THE SPECIES

Capsule ovoid, often pointed, but not long beaked or bottle-shaped
  Scales mostly reaching the stamens, styles about equaling the ovary or somewhat shorter.....47. *C. Gronovii*
  Scales mostly shorter than the tube, broad, often truncated, styles mostly very short, capsules mostly comparatively large.....48. *C. curta*
Capsule ovoid, with a long, beak-like projection at the top, giving the capsule a bottle shape.....49. *C. rostrata*

47. Cuscuta Gronovii Willdenow

Cuscuta Gronovii Willdenow in Roemer & Schultes, Syst. **6**: 205. 1820.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 281. *pl. 4. f. 3.* 1841; also in DC. Prodr. **9**: 459. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 507. 1859.—Matthew, Bull. Torrey Club **20**: *pl. 165. f. 9.* 1893.—Britton & Brown, Illust. Flora **3**: 30. *f. 2963.* 1898 & 2d ed. **3**: 51. *f. 3449.* 1913.—Hemsley, Jour. Bot. **46**: 241. *pl. 493.* 1908.—Stevens, Am. Jour. Bot. **3**: 185. *f. 7, 8, 12.* 1916.—Yuncker, Ill. Biol. Monogr. **6**: 154. *f. 37a–e, 100, 101, 148.* 1921; Proc. Ind. Acad. Sci. **1919**: 162. *f. 5.* 1921.—Campanile, Annali di Bot. **16**: *f. 8, 11.* 1926.

Cuscuta umbrosa Beyrich in herb., ex Hooker, Fl. Bor. Am. **2**: 78. 1840, in part.

Cuscuta vulgivaga Engelmann, Am. Jour. Sci. & Arts **43**: 338. *pl. 6. f. 12–16.* 1842.

Cuscuta vulgivaga laxiflora Engelmann, Am. Jour. Sci. & Arts **43**: 338. 1842.

Cuscuta vulgivaga glomerata Engelmann, Am. Jour. Sci. & Arts **43**: 338. 1842.

Cuscuta vulgivaga tetramera Engelmann, Am. Jour. Sci. & Arts **43**: 338. 1842.

Cuscuta Gronovii vulgivaga Engelmann, Trans. Acad. Sci. St. Louis **1**: 508. 1859.

Cuscuta polyantha Shuttleworth in herb.

Epithymum Gronovii (Willdenow) Nieuwland & Lunell, Am. Midl. Nat. **4**: 511. 1916.

Cuscuta domingensis Urban, Repert. Spec. Nov. **9**: 32. 1919.

Stems medium to coarse. Flowers 2–4 mm. long, mostly 5-parted, more or less glandular, on pedicels shorter than, or about equaling, or, sometimes, longer than, the flowers, in loose or densely panicled cymes. Calyx lobes broad, ovate, orbicular or oblong, obtuse, overlapping, shorter than the corolla tube, often with uneven edges. Corolla lobes mostly shorter than the campanulate tube, ovate, obtuse, spreading. Scales variable, shorter than, or mostly about equaling, the tube,

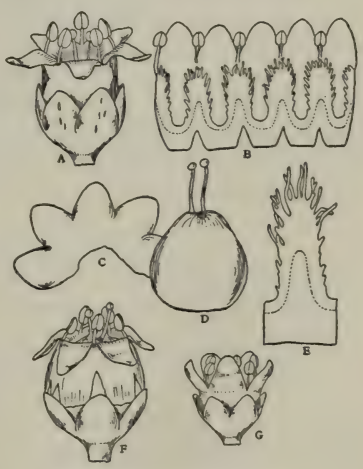

Fig. 47. A-E, C. Gronovii; F, var. calpytrata; G, var. Saururi.

ovate, or mostly oblong, infrequently more or less truncated or divided, deeply fringed with longer processes towards the top and shorter ones towards the base and frequently on the bridge which is below the middle. Stamens nearly as long as the lobes, filaments longer than the oval anthers. Styles mostly shorter than the globose-conic ovary, or longer, stoutish and often more or less subulate. Capsule globose-conic (sometimes globose or obpyriform), commonly glandular, enveloped by the withered corolla with the upper part of capsule exposed (or rarely with the corolla about the top); seeds about 1.5 mm. long, two to four in a capsule, compressed, obliquely ovate, slightly rostrate, hilum linear, oblique or transverse.

This species shows great variation in the size and proportion of its flower parts and it is sometimes difficult to distinguish the different forms given below. It is the commonest and most abundant of the North American species extending from Maine and Nova Scotia to Florida and westward through Canada to Manitoba, the Dakotas, Nebraska, Arizona and Texas. It is more abundant in the central and northeastern regions. Von Turckheim collected two specimens near Constanza, Santo Domingo (*No. 3480*, the type of *C. domingensis*, in hb. Urban, in Botanical Institute at Dahlem, and *No. 3513*) which, so far as I can determine, are identical with the forms from the mainland. This species shows no specialization of hosts but grows on a large number of different species of herbaceous and woody plants, e.g., *Rubus*, *Cephalanthus*, *Aster*, *Solidago*, *Dianthera*, *Tecoma*, *Impatiens*, *Eupatorum*, *Polygonum*, *Salix*, *Saururus*, *Hypericum*, *Desmodium*, *Rhus*, *Vernonia*, *Rudbeckia*, *Pelargonium*, *Laportea*, *Latuca*, *Phytolocca*, *Artemesia*, *Solanum*, *Allium*, *Polypodium*, *Urtica*, *Chrysanthemum*, *Mikania*, *Boehmeria*, *Acalpha*, *Jussiaea*, *Mesosphaerum*, etc. It is commonly found in low places along water courses.

Type.—From Virginia?

Cuscuta Gronovii Saururi (Engelmann) MacMillan

Cuscuta Gronovii Saururi (Engelmann) MacMillan, Metaspermae of the Minnesota Valley 430. 1892.

Cuscuta Saururi Engelmann, Am. Jour. Sci. & Arts **43**: 339. *pl. 6. f. 17–21.* 1842.

Cuscuta Gronovii latiflora Engelmann, Trans. Acad. Sci. St. Louis **1**: 508. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 155. *f. 37f–g.* 1921.

Calyx lobes nearly as long as, or mostly equaling, the shallowly campanulate corolla, the lobes of which nearly, or about, equal the tube. Specimens which intergrade with *C. Gronovii* are not uncommon.

This form is less common than *C. Gronovii* but is found throughout the same range and on similar hosts.

Type.—'Margin of lakes and swamps, in the "American Bottom" opposite St. Louis,' on *Saururus* (*Geyer* in 1841, in the herbarium of the Missouri Botanical Garden).

Cuscuta Gronovii calyptrata Engelmann

Cuscuta Gronovii calyptrata Engelmann, Trans. Acad. Sci. St. Louis **1**: 508. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 157. 1921.
Cuscuta bonariensis Hort. ex Engelmann, Bot. Zeit. **4**: 278. 1846.
Cuscuta chilensis in H.B. Frib., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 508. 1859. Not Ker-Gawler nor Bertero.
Cuscuta calyptrata (Engelmann) Small, Fl. S.E. United States 969. 1903.

This variety differs from the typical form in the usually longer corolla and with corolla lobes less than half as long as the tube. The calyx lobes are oval-oblong and commonly serrated. The withered corolla caps the capsule.

Mostly in the southern United States from Texas to Louisiana. Deam collected a specimen (*No. 40032*) on *Solidago* in Clark County, Indiana, and another (*No. 32912*) on *Saururus* in Sullivan County, Indiana which have the withered corolla definitely at the top of the capsule. In all other respects, however, these two specimens are identical with *C. Gronovii*. This variety has been introduced into Europe, where it has become established, commonly on *Salix*. It is often incorrectly named *C. Cesatiana* in the European herbaria. I have carefully studied this variety and do not believe it should be maintained as a distinct species.

Type.—Western Louisiana (*Gregg*, in the herbarium of the Missouri Botanical Garden).

Specimens examined from Europe.—GERMANY: Rhine Prov. (*Baenitz hb. Europ. 5012*); Rolandseck (*Seemen* in 1891); Mondorf (*Wilczek* in 1903). Franken, Mainufer bei Veitshöchheim (*Diels* in 1917); Frankfort a/M. (*Dürer* in 1899; in 1889; *Semholz* in 1883); Bavaria, Würzburg (*Landauer; Bot. Ver. Würzburg* in 1898; *Rost* in 1898); Hallstadt, near Bamberg (*Harz 5298;* in 1904; in 1905); Eltman (*Eisenbarth* in 1898); Baden, Heidelberg (*Urban 2976/83*).

48. **Cuscuta curta** (Engelmann) Rydberg

Cuscuta curta (Engelmann) Rydberg, Bull. Torrey Club **40**: 466. 1913.—Stevens, Am. Jour. Bot. **3**: 185. *f. 5–6*. 1916 (not *C. plattensis*).—Yuncker, Ill. Biol. Monogr. **6**: 157. *f. 38, 98, 99, 136*. 1921.
Cuscuta Gronovii curta Engelmann, Trans. Acad. Sci. St. Louis **1**: 508. 1859.
Cuscuta umbrosa Hooker, Fl. Bor. Am. **2**: 78. 1840, in part, ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 508. 1859.
Cuscuta megalocarpa Rydberg, Bull. Torrey Club **28**: 501. 1901.

Stems coarse. Flowers 2–3 mm. long, on short pedicels as long as, or mostly shorter than, the flowers, in cymose panicles, the clusters becoming globular through the growth and crowding of the capsules. Calyx lobes ovate, obtuse,

overlapping, their edges infrequently slightly serrulate and uneven, reaching to about the middle of the corolla tube. Corolla campanulate, lobes triangular, obtuse, spreading, ordinarily reflexed in fruit. Scales shorter than the tube, rather variable, but mostly truncated or more or less divided and fringed with medium length processes, bridged at about the middle. Stamens slightly shorter than, or about as long as, the corolla lobes; anthers oval, exceeding, or about equal to, or shorter than, the subulate filaments. Ovary globose-conic, styles very short, about one-fourth the length of the ovary. Capsule globose-conic, somewhat umbonate or beaked, 3–6 mm. in diameter, with the withered corolla mostly about the upper part, but sometimes at the base, intrastylar aperture rather large, styles usually convergent; seeds 2–2.8 mm. long, slightly rostrate, hilum transverse or oblique.

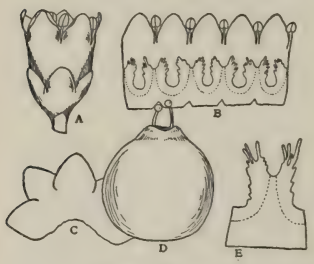

Fig. 48. C. curta.

This species is closely allied with *C. Gronovii* of which Engelmann considered it a variety. It differs from that species, however, in the larger capsules, shorter styles and mostly bifid and truncated scales.

With his original description of *C. plattensis* Nelson included in his citation of specimens one collected by Elias Nelson in Horseshoe Park, Wyoming. This specimen is not what I take to be his *C. plattensis* but is this species. Nieuwland & Lunell, Am. Mid. Nat., **4**: 511. 1916, also confused the two species.

Minnesota to Wyoming and southward to Colorado and New Mexico. On *Convolvulus, Scutellaria, Salix*, etc. One specimen collected on flax was reported as being very destructive.

Type.—Northwestern America (*Douglas*, a specimen in the Kew Herbarium).

49. **Cuscuta rostrata** Shuttleworth

Cuscuta rostrata Shuttleworth in herb., ex Engelmann, Boston Jour. Nat. Hist. **5**: 225. 1845; Bot. Zeit. **4**: 278. 1846; Trans. Acad. Sci. St. Louis **1**: 508. 1859.—Matthew, Bull. Torrey Club **20**: *pl. 165. f. 10.* 1893.—Britton & Brown, Illust. Flora **3**: 30. *f. 2964.* 1898; 2d ed. **3**: 51. *f. 3450.* 1913.—Yuncker, Ill. Biol. Monogr. **6**: 153. *f. 40, 102, 103, 139.* 1921.

Cuscuta oxycarpa Engelmann, Boston Jour. Nat. Hist. **5**: 225. 1845, in synon.

Stems coarse. Flowers glabrous but more or less glandular, 4–6 mm. long, on pedicels shorter than the flowers in compact, paniculate cymes. Calyx shorter than the campanulate corolla, lobes ovate, obtuse, overlapping. Corolla membranous, cells very prominent, somewhat thickened lines running

lengthwise below the stamen insertions giving the corolla an angled appearance, lobes shorter than the tube, broad, ovate, obtuse, erect, becoming spreading and later reflexed in fruit. Scales shorter than the tube or about reaching the stamens, oblong, deeply fringed with long processes, shorter processes frequently evident on the bridge which is about a third or less of their height. Stamens shorter than, or about as long as, the lobes, anthers oval, shorter than the subulate filaments. Ovary flask-shaped, beaked. Capsule globose, beaked, enveloped by the withered corolla; seeds about 2.4 mm. long, varying from one to four in each capsule, slightly rostrate, obovate or oblong, oblique, hilum oblique or transverse.

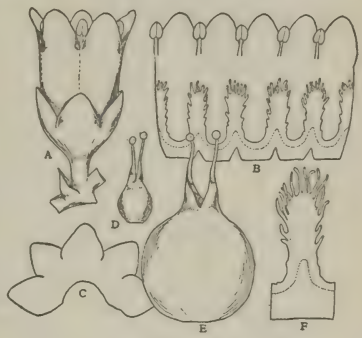

Fig. 49. C. rostrata.

In the Alleghany Mountains from Virginia to South Carolina. On *Aster*, *Urtica*, *Rubus*, *Solidago*, *Rudbeckia*, *Impatiens*, etc.

Type.—Little Craggy Mountains. N. Carolina (*Rugel*, a specimen in the herbarium of the Missouri Botanical Garden).

Subsection Lepidanche

Lepidanche Engelmann, Am. Jour. Sci. & Arts **43**: 343. 1842.
Cuscuta subsection *Lepidanche* Engelmann, Trans. Acad. Sci. St. Louis **1**: 509. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 162. 1921.

Flowers pedicellate, or mostly sessile, often endogenously formed, surrounded by several closely investing bracts, mostly in dense, compact clusters. Calyx lobes distinct. Withered corolla at the top of the somewhat conic capsule.

KEY TO THE SPECIES

Flowers pedicelled, loosely paniculate, bracts numerous or few in the inflorescence, usually at least one subtending each flower.....50. *C. cuspidata*
Flowers sessile in dense clusters
Bracts closely appressed to the flowers, not squarrose
Bracts acute.....51. *C. squamata*
Bracts obtuse.....52. *C. compacta*
Bracts squarrose.....53. *C. glomerata*

50. **Cuscuta cuspidata** Engelmann

Cuscuta cuspidata Engelmann, Boston Jour. Nat. Hist. **5**: 224. 1845;—Bot. Zeit. **4**: 277. 1846;—Trans. Acad. Sci. St. Louis **1**: 509. 1859.—Matthew, Bull. Torrey Club

20: *pl. 165. f. 8.* 1893.—Britton & Brown, Illust. Flora 3: 30. *f. 2965.* 1898; 2d ed. 3: 51. *f. 3451.* 1913.—Yuncker, Ill. Biol. Monogr. 6: 162. *f. 49, 105, 134.* 1921;—Am. Jour. Bot. 27: 48. *f. 1.* 1921.

Cuscuta cuspidata pratensis Engelmann, Boston Jour. Nat. Hist. 5: 224. 1845.

Cuscuta cuspidata humida Engelmann, Boston Jour. Nat. Hist. 5: 224. 1845.

Stems medium. Flowers about 4 mm. long, membranous, pedicelled, or subsessile, in loose or dense, panicled clusters, the whole inflorescence bracteate. Calyx of distinct, or very slightly united, segments, subtended by one or more ovate, or orbicular, mostly obtuse, or acutish, sometimes cuspidate bracts, sepals of similar shape, obtuse, or acute, and cuspidate, sometimes glandular thickened along the median portion and with the edges more or less serrulate. Corolla lobes oblong or ovate, shorter than the funnel-form tube, obtuse or acutish, sometimes with a mucronate or cuspidate tip, usually with a row of glandular cells along the median portion. Scales oblong, shorter than the tube, or reaching the filaments, fringed with medium length processes, bridged at about the middle. Stamens shorter than the lobes, anthers oval, somewhat cordate, usually shorter than the filaments. Styles slender and much longer than the globose or slightly conic ovary. Capsule globose, with a slightly thickened ridge or collar about the intrastylar aperture, frequently with numerous glandular cells, carrying the withered corolla at the apex; seeds about 1.4 mm. long, slightly obovate, compressed or angular, hilum short, oblong or oval, oblique or nearly transverse.

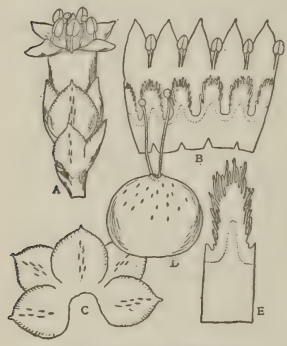

Fig. 50. C. cuspidata.

Southern Indiana, where it was collected at New Harmony by Deam (*No. 33011*), westward to North Dakota, Utah and Colorado and southward to Louisiana and Texas. On *Tephrosia, Ambrosia, Iva, Liatris* and other herbaceous hosts.

Type.—'Dry prairies west of the Brazos' (*Lindheimer 125*, in the herbarium of the Missouri Botanical Garden).

51. **Cuscuta squamata** Engelmann

Cuscuta squamata Engelmann, Trans. Acad. Sci. St. Louis 1: 510. 1859.—Yuncker, Ill. Biol. Monogr. 6: 163. *f. 51, 117, 135.* 1921.

Stems slender. Flowers sessile, 5–6 mm. long, few to several in separate or glomerate clusters, subtended by 2–10 ovate, acute, often cuspidate, serrulated, closely appressed bracts that are shorter than the calyx. Calyx lobes distinct, ovate, acute, cuspidate, closely appressed, somewhat serrulate, equaling the corolla tube, in appearance much as the bracts. Corolla cylindrical,

lobes ovate-lanceolate, or oblong, acute, sometimes somewhat cuspidate, spreading or reflexed. Scales about reaching the filaments, oblong, their processes of medium length and numerous, or short and scattered, bridged at about the middle. Stamens shorter than the lobes, filaments as long as, or shorter than, the oblong-oval anthers. Ovary globose to slightly conic, somewhat two-pointed, styles longer than the ovary, stigmas capitate. Capsule globose, slightly conical to pointed by the thickened apex, somewhat glandular on the upper part, carrying the withered corolla at the top; seeds about 1.5 mm. long, slightly oblique, one or sometimes two in a capsule, globose or compressed, hilum short, linear, oblique.

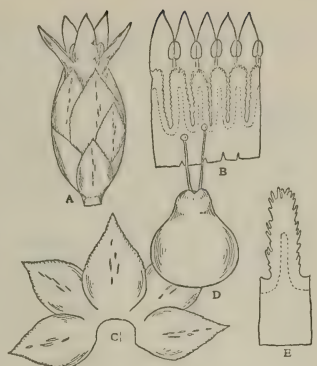

Fig. 51. C. squamata.

New Mexico, Texas and northern Mexico. 'On *Artemisia, Ludoviciana, Helianthus ciliatus* and other weeds.'

Type.—Western Texas to El Paso (*Wright 518*, a specimen in the herbarium of the Missouri Botanical Garden).

52. **Cuscuta compacta** Jussieu

Cuscuta compacta Jussieu in Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 281. *pl. 4. f. 2.* 1841.—also in DC. Prodr. **9**: 458. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 511. 1859.—Matthew, Bull. Torrey Club **20**: *pl. 165. f. 11.* 1893.—Britton & Brown, Illust. Flora **3**: 31. *f. 2966.* 1898; 2d ed. **3**: 52. *f. 3452.* 1913.—Yuncker, Ill. Biol. Monogr. **6**: 165. 1921.

?Cuscuta acaulis Rafinesque, Annals of Nature **1**: 13. 1820.
Lepidanche adpressa Engelmann, Am. Jour. Sci. & Arts **45**: 77. 1843.
Cuscuta glomerata adpressa Choisy, in DC. Prodr. **9**: 458. 1845.
Cuscuta coronata Beyrich in herb.
Cuscuta imbricata Nuttall in herb.
Cuscuta remotiflora Bertoloni, Mem. Accad. Sci. Bologna **2**: 311. 1850.
Cuscuta compacta adpressa Engelmann, Trans. Acad. Sci. St. Louis **1**: 511. 1859.
Cuscuta fruticum Bertoloni, Mem. Accad. Sci. Bologna **2**: 312. 1850.
Cuscuta compacta typica Yuncker, Ill. Biol. Monogr. **6**: 166. *f. 54a–e, 106, 131.* 1921.

Stems coarse. Flowers 4–5 mm. long, sessile, not infrequently endogenously formed, in compact clusters about the host, or in scattered glomerules. Sepals distinct, orbicular or oval, cupped, sometimes fringed with short, slender, filamentous processes, surrounded by 3–5 similar, appressed bracts, walls

of cells of bracts and sepals heavily thickened. Corolla cylindrical, becoming urceolate in fruit, lobes spreading to reflexed, oblong, obtuse, infrequently fringed with short, filamentous processes, much shorter than the tube. Scales about reaching the stamens, fringed with long processes, bridged at about the middle, or below, small scales frequently appearing on the bridge between the larger ones. Stamens shorter than the lobes, anthers oval, about equal to, or longer than, the short, thick filaments. Ovary globose, conical, thickened at the top. Capsule globose-conic, slightly pointed, glandular about the top which is surrounded by the withered corolla; seeds about 2.6 mm. long, globose, ovate, angled or flattened on one side, scurfy, hilum oblong, oblique.

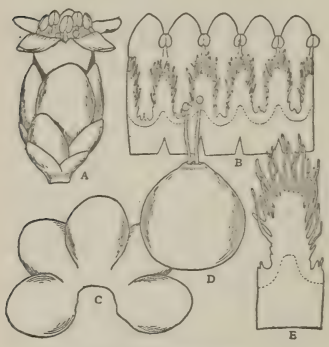

Fig. 52. C. compacta.

From the New England states southward and westward through the central and southern states to Florida, Louisiana, Arkansas and Texas. On a large number of different species of woody and herbaceous hosts, as *Sassafras, Saururus, Tecoma, Cephalanthus, Rhus, Aster, Alnus, Vitis, Ilex, Rosa, Rubus, Magnolia, Vaccinium, Leucothoe, Solidago,* etc.

Type.—'Hab. Amer. septentrionalem' (*Beauvois*). Not seen, but a specimen collected by Gray in Alabama and cited by Choisy was examined in the De Candolle herbarium.

Cuscuta compacta efimbriata Yuncker

Cuscuta compacta efimbriata Yuncker, Ill. Biol. Monogr. **6**: 167. *f. 54f.* 1921.

Scales shorter than the much exserted tube, and much reduced, bifid or winged, and with few processes.

Specimens examined.—Florida: Duval County (*Fredholm 305*, the type, in the U. S. National Herbarium, as sheet 214,815). Known only from the type locality.

53. **Cuscuta glomerata** Choisy

Cuscuta glomerata Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 280. *pl. 4. f. 1.* 1841.—also in DC. Prodr. **9**: 458. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 510. 1859.—Matthew, Bull. Torrey Club **20**: *pl. 165. f. 12.* 1893.—Britton & Brown, Illust. Flora **3**: 31. *f. 2967.* 1898; 2d ed. **3**: 52. *f. 3453.* 1913.—Yuncker, Ill. Biol. Monogr. **6**: 164. *f. 50, 120, 137.* 1921;—Proc. Ind. Acad. Sci. **1919**: 158. *f. 1.* 1921.

?Cuscuta aphylla Rafinesque, Am. Monthly Mag. & Crit. Rev. **4**: 40. 1818. Not Loureiro.

?Cuscuta paradoxa Rafinesque, Ann. Nature **1**: 13. 1820.
Cuscuta americana Hooker, Comp. Bot. Mag. **1**: 173. 1836. Not Linnaeus.
?Anthanema paradoxa Rafinesque, Fl. Tellur. **4**: 90. 1836.
?Anthanema verticillata Rafinesque, Fl. Tellur. **4**: 90. 1836.
Lepidanche Compositarum Engelmann, Am. Jour. Sci. & Arts **43**: 344. *pl. 6. f. 30–35.* 1842.
Lepidanche Compositarum Solidaginis Engelmann, Am. Jour. Sci. & Arts **43**: 344. 1842.
Lepidanche Compositarum Helianthi Engelmann, Am. Jour. Sci. & Arts **43**: 344. 1842.
Lepidanche squarrosa Engelmann, London Jour. Bot. **2**: 197. 1843, as proposed name for *Lepidanche Compositarum.*

Stems medium, disappearing early from between the dense, straw-colored, rope-like floral masses which are wound tightly about the stem of the host. Flowers 4–5 mm. long, sessile, mostly endogenously formed, breaking forth in two, parallel rows on opposite sides of the stem, much inbricated with numerous, scarious, lacerated, cupped, oblong, obtuse, or mostly acute, bracts with mostly recurved tips. Sepals distinct, oblong-oval, obtuse to acutish, their tips somewhat spreading, but ordinarily not recurved, otherwise similar to the bracts. Corolla lobes spreading or sometimes reflexed, oblong to lanceolate, obtuse or acutish, sometimes mucronate, usually with a row of glandular cells along the mid-portion, shorter than the cylindrical tube. Scales shorter than the tube, oblong, more profusely fringed at the top than along the sides, bridged at about the middle or above. Stamens shorter than the corolla lobes, anthers elliptical to oblong, about as long as, or shorter than, the filaments. Styles capillary, much longer than the somewhat flask-shaped ovary. Capsule globose-pointed or flask-shaped, with the withered corolla carried at the apex; seeds about 1.7 mm. long, oval, globose, slightly compressed, one, or infrequently two, in a capsule, or, not infrequently, sterile, hilum oblong, oval, transverse.

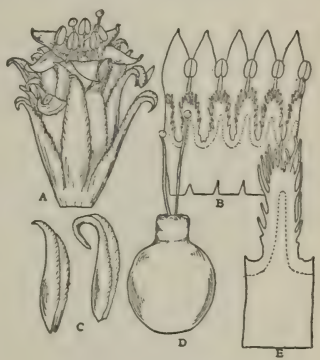

Fig. 53. C. glomerata.

The yellow, rope-like masses of sessile, densely bracteated flowers tightly wound about the stems of its host make this one of the most easily recognized of the North American species.

Throughout the prairie states from southwestern Michigan and Indiana southward to Mississippi and westward to South Dakota, Nebraska and Texas. Mostly on *Helianthus, Solidago, Aster* and other Compositae.

Type.—'Hab. prope St. Louis in Missouri' (*Riehl 15*, a specimen in the herbarium of the Missouri Botanical Garden).

Section Eugrammica

Capsules more or less regularly circumscissile. Flowers mostly without numerous subtending bracts. A few species have distinct, dorsal, sub-terminal prongs on the corolla lobes. Styles slender or tapering from broad bases. Typically of the southwestern and southern United States, West Indies, Mexico and South America. A few species from the Old World also belong here.

KEY TO THE SUBSECTIONS

Flowers not subtended by numerous bracts, calyx mostly gamosepalous (distinct or nearly so in Ceratophorae)
- Styles mostly stout and more or less subulate and tapering into the globose or conic ovary
  - Corolla and calyx lobes obtuse
    - Calyx definitely gamosepalous
      - Calyx lobes not overlapping, capsule depressed-globose, styles mostly short ..... Grandiflorae p. 183
      - Calyx lobes overlapping
        - Ovary globose, styles equaling or exceeding it in length, style not broadly subulate ..... Odoratae p. 188
        - Ovary globose to conic, tapering into very broadly subulate and moderately short styles ..... Subulatae p. 195
    - Calyx deeply divided, lobes distinct, or nearly so ..... Ceratophorae p. 198
  - Corolla lobes acute ..... Acutilobae p. 201
- Styles slender, usually about the same thickness throughout (may be stoutish and somewhat subulate in Tinctoriae)
  - Calyx lobes obtuse (usually also the corolla lobes)
    - Flowers about as broad as long, calyx about as long as the corolla tube ..... Tinctoriae p. 208
    - Flowers longer than broad ..... Americanae p. 217
  - Calyx lobes (also usually the corolla lobes) acute (calyx lobes obtuse in *C. deltoidea*), styles slender and mostly capillary
    - Corolla lobes not more than one-third as long as the tube, obtuse or acutish, flowers much elongated, calyx very deep ..... Prismaticae p. 225
    - Corolla lobes mostly much longer in proportion to the corolla tube
      - Flowers mostly on pedicels no longer than the flowers, in dense or loose inflorescences, corolla lobes mostly shorter than the tube ..... Odontolepisae p. 226
      - Flowers mostly longer pedicellate, forming loose, fasciculate or umbellate inflorescences, corolla lobes longer than, or shorter than, the tube
        - Corolla campanulate, lobes upright or reflexed, equaling or longer than the tube, calyx about equaling the corolla tube ..... Umbellatae p. 234
        - Corolla more cylindric, lobes mostly no longer than the tube, often shorter, calyx much shorter than the tube ..... Leptanthae p. 242

Flowers subtended by numerous bracts, calyx deeply divided with the lobes distinct or essentially so, inflorescences dense ..... Lepidanchopsis p. 244

Subsection Grandiflorae

Flowers mostly pedicellate, in few- or many-flowered cymules. Scales lacking or present, often much reduced, perianth lobes obtuse, calyx lobes not overlapping. Ovary and capsule globose-depressed, styles mostly short.

KEY TO THE SPECIES

Flowers scaleless, capsule papillate.....54. *C. grandiflora*
Flowers with infrastaminal scales
  Corolla lobes as long as, or longer than, the corolla tube
    Ovary and capsule papillate, styles short.....55. *C. argentinana*
    Ovary and capsule not papillate, styles lacking or very short.....56. *C. Friesii*
  Corolla lobes much shorter than the tube
    Flowers on pedicels longer than the flowers, stigmas large and convoluted, scales very short.....57. *C. brevisquamata*
    Flowers on pedicels shorter than the flowers, stigmas mostly normal size, scales various (may be lacking).....58. *C. Kilimanjari*

54. **Cuscuta grandiflora** Humboldt, Bonpland & Kunth

Cuscuta grandiflora Humboldt, Bonpland & Kunth, Nov. Gen. et Sp. Pl. **3**: 123 (97 in folio edition), *pl. 213.* 1818.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 278 1841.—also in DC. Prodr. **9**: 457. 1845.—Yuncker, Am. Jour. Bot. **9**: 560. *pl. 1 f. 6a–d.* 1922.

Stems medium. Flowers 4–6 mm. long, rarely smaller (3 mm.), 5-parted, yellowish, but commonly with a dark band of color about the throat of the corolla, on pedicels mostly shorter than, or exceeding, the length of the flowers, in few- to many-flowered, loose, cymose clusters. Perianth segments finely fimbriated with short, filamentous processes. Calyx broad, about as long as the corolla tube, lobes triangular-ovate, obtuse, not overlapping. Corolla shallowly and broadly campanulate, lobes upright to spreading, broadly ovate, overlapping, obtuse. Stamens attached below the sinuses, not reaching the middle of the corolla lobes, anthers oval, often curving, shorter than the subulate filaments. Scales none. Styles subulate, stout, shorter than the globose ovary, stigmas comparatively small, flattened, or globose.

Fig. 54. C. grandiflora.

Capsule depressed-globose, circumscissile, with the withered corolla at its base, all parts of the ovary and capsule papillate; seeds 3–4 in each capsule, rough, roundish, 1.5–2 mm. long, hilum oblong.

This is a very pretty species which is easily identified by the large flowers without scales, with the stamens situated below the sinuses, and with papillate fruit.

In the Andean region from Colombia to Chile. Often on woody hosts as *Rubus, Schinus molle, Vaccinium*, etc.

Specimens examined.—COLOMBIA: (*Purdie* in 1849; *Lehman 6630; 4794; Humboldt*, the type, a specimen in the herbarium of the Botanical Institute at Dahlem; *voyage de J. Triana* 1851–57); Bogota (*Holton 543; Goudot*); Dept. Santander, vicinity of Vetas, alt. 3100–3250 meters (*Killip & Smith 17906*); Dept. Norte de Santander, vicinity of Mutiscua, alt. 2900–3600 meters (*Killip & Smith 19645*).—ECUADOR: Prov. Tunguragua, near Ambato (*Pachano 140*); Prov. Leon, Latacunga, alt. 2700 meters (*Holmgren 594*).—PERU: (*Weberbauer 885; Gay 2260; 2287*); Tarma, alt. 7000 ft. (*McBride & Featherstone 1043*); Yanahuanca, alt. 10000 ft. (*McBride & Featherstone 1230*); Dept. Cuzco (*Weberbauer 4930; Weddell 4768; Herrera 678*); San Sebastian (*Pennell 13613*); Sacsahuaman. alt. 3500–3600 meters (*Pennell 13550*); Ollantayambo, alt. 3000 meters (*Cook & Gilbert 1220*); between Calca and Urubamba (*Cook & Gilbert 249*); Temple of Viracocha, near Tinta, alt. 3500 meters (*Cook & Gilbert 219*).—BOLIVIA: (*Fiebrig 3232; Fries 1287*); near Tarija (*Fiebrig 3230*); Sorata (*E.W.D. & Mary M. Holway* in 1920; *Weddell 4518; Williams 2396; Mandon 1479; 1499*); Unduavi (*Rusby 2003; Buchtien 460;* in 1910; *752*); Pelechuco (*Williams 2490*); LaPaz (*E.W.D. & Mary M. Holway* in 1920; *Buchtien 2946; 4501;* in 1912; *Bang 115*, in part); between Palca & LaPaz (*Pflanz 40; 454*).—CHILE: (*Edmonston*).—ARGENTINA. Prov. Catamarca, Dept. Andagala (*Jörgensen 1420*); Prov. Salta, Nevado del Castillo (*Hieronymus & Lorentz 124*).

55. **Cuscuta argentinana** Yuncker

Cuscuta argentinana Yuncker, Am. Jour. Bot. 9: 561. *pl. 2. f. 11a–e.* 1922.

Stems medium. Flowers 2–3 mm. long, on pedicels shorter than, or exceeding, the flowers, in loose, umbellate, or cymose clusters. Calyx shallowly campanulate, or rotate, lobes ovate or triangular, obtuse, about as long as the corolla tube. Corolla lobes spreading, broadly ovate, obtuse, longer than the shallowly campanulate-rotate tube, edges more or less revolute and in some flowers finely serrated. Stamens inserted at the sinuses, curving in over the ovary, filaments stout, subulate, and equal to, or longer than, the oval anthers. Scales thick, exceeding the tube, spatulate, fringed with short processes, bridged very low. Ovary depressed-globose, papillate, styles very short, stout, stigmas flattened. Capsule depressed-globose, papillate, circumscissile, with a thickened collar about the large intrastylar aperture, the withered corolla at the base; seeds two to four in each capsule, about 2 mm. long, oval, hilum oblique.

This species superficially resembles *C. grandiflora* but differs principally in the possession of scales, shorter styles, insertion of stamens, etc.

Specimens examined.—ARGENTINA: (*Jörgensen 1160*, the type, in the U. S. National Herbarium as sheet 704,804). Known only from the type locality.

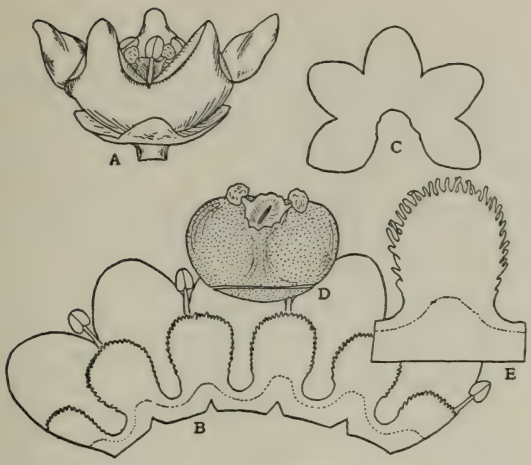

Fig. 55. C. argentinana.

56. **Cuscuta Friesii** n. sp.

Flores membranacei, 3–4 mm. longi. Calycis lobi corollae tubo aequantes, ovati, obtusi. Corollae lobi aequantes aut longiores quam vadosus, late campanulatus tubus, late ovatis, obtusus. Scalae late spatulatae aut paululum truncatae. Ovarium globosum. Stigmata sessilia. Capsula depresso-globosa.

Stems medium. Flowers membranous, 3–4 mm. long, on thickish pedicels which are shorter than, or exceeding, the length of the flowers, in lateral, cymose, few-flowered clusters. Calyx lobes as long as the corolla tube, ovate, obtuse, slightly, or not at all, overlapping. Corolla lobes upright to spreading, about equaling, or longer than, the shallow, broadly campanulate tube, broadly ovate, obtuse, slightly overlapping at the base. Stamens shorter than the lobes, subulate filaments longer than the oval anthers. Scales reaching the stamens, broadly spatulate, sometimes more or less truncated, fringed with short processes about the upper part, bridged below the middle. Ovary globose, styles apparently lacking, stigmas sessile, more or less peltate and frilled. Capsule depressed-globose, circumscissile, the withered

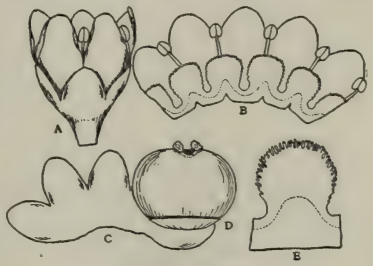

Fig. 56. C. Friesii.

corolla about it and towards the base; seeds about 1.5 mm. long, ovate, hilum linear and terminal.

I formerly considered the specimen on which this species is founded to be *C. microstyla* of Engelmann. (Am. Jour. Bot. **9**: 561. *pl. 1. f. 4a-e.* 1922). Examination of more abundant material of the type collection of *C. microstyla* at Kew shows, however, that it is not the same as Engelmann's species.

Specimens examined.—ARGENTINA: Prov. Jujuy, Nevado de Chañi (*Fries 906*, the type, in hb. Regnell, in the Botanical Museum at Stockholm). Known only from the type locality.

57. **Cuscuta brevisquamata** Yuncker

Cuscuta brevisquamata Yuncker, Am. Jour. Bot. 9: 560. *pl. 1. f. 1a–e.* 1922.
?Cuscuta Flossdorfii Hicken, Darwiniana **1**: 31. 1922.

Stems medium. Flowers 4–6 mm. long, on pedicels mostly longer than the flowers, in loose, few-flowered, umbellate or cymose clusters. Calyx loose and spreading from the corolla, lobes triangular-ovate, obtuse, not overlapping. Corolla campanulate, becoming urceolate in fruit, lobes shorter than the tube, ovate, obtuse, upright, edges finely serrated and uneven. Stamens at the sinuses, shorter than the lobes, anthers oval or oblong, about as long as the filaments. Scales very short, mostly not reaching the middle of the tube, truncated or triangular, bridged at about the middle, with a few medium-length processes about the top, or sometimes these lacking. Styles subulate, shorter than the depressed-globose ovary, stigmas large, peltate. Capsule depressed-globose, circumscissile, intrastylar aperture large, withered corolla about the upper part; seeds about 2.5 mm. long, reddish, usually four in each capsule, hilum short.

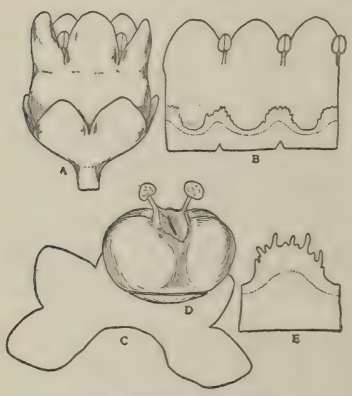

Fig. 57. C. brevisquamata.

This species, which resembles *C. grandiflora* in many respects, differs in the possession of scales, a smooth capsule, and shorter stamens which are situated at the sinuses. It differs from *C. argentinana* in its short scales, longer styles and smooth capsule.

Specimens examined.—ARGENTINA: Sierra Achale de Cordoba (*Hieronymus* Feb. 2, 1883, the type, in the herbarium of the Botanical Institute at Dahlem). Known only from the type locality.

58. Cuscuta Kilimanjari Oliver

Cuscuta Kilimanjari Oliver in Johnston, The Kilimanjaro Exped. Append. 343. 1886, nomen; Trans. Linn. Soc. Bot. II. 2: 343. 1887.

Stems medium to coarse. Flowers 4–5 mm. long and about as broad, reported by collectors as "waxy-white", on pedicels shorter than the flowers, in few-flowered cymes, somewhat coriaceous in dried specimens. Calyx cupulate and loose about the corolla and nearly enclosing it, lobes ovate-orbicular, obtuse, overlapping at the base, thickish and often carinate. Corolla lobes ovate-orbicular, obtuse, shorter than the campanulate-cylindrical tube, often revolute. Stamens shorter than the lobes, filaments stoutish and more or less subulate, about equal to, or exceeding, the oval or globose anthers. Scales triangular or oblong, uneven about the truncated apex and sides in irregular projections, or nearly smooth, about reaching the stamens, or exserted, bridged below or at about the middle, projections often present on the bridges, or the scales may be more or less reduced. Styles shorter than the globose ovary, stigmas mostly flattened and convoluted. Capsule globose, intrastylar aperture large, irregularly circumscissile, with the withered corolla about it, leaving the cordate dissepiment in the persistent calyx; seeds 2–4 in each capsule, oval, about 1.5–3 mm. long, somewhat rostrate, hilum oblong, diagonal or perpendicular.

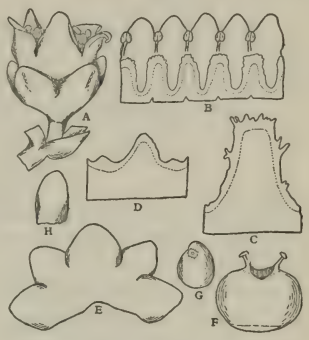

Fig. 58. C. Kilimanjari.

Oliver states that the scales are absent, but they were found to be present in what is taken as the type in the Kew herbarium. They are lacking, however, in variety *rukararana*. This species is often erroneously named *C. obtusiflora* in herbaria, but it is easily distinguished from that species by its definitely circumscissile capsule, and from *C. cassytoides*, another African species, it differs in not having the styles united.

Eastern Africa, Abyssinia to the Transvaal, mostly above 3000 feet high.

Specimens examined.—Massaihocland: Mau Plateau 2300–3000 meters, Landiani to Njora (*Baker* in 1905).—Abyssinia: Galla Land (*Ellenbeck 1409*). Somaliland (*Riva 387*).—British East Africa: From camp on Mt. Kenya, 2500 meters, at lower border of bamboo zone, westward to the Kasorongai river, 1950 meters (*Mearns 1836*); lower border of bamboo zone, Mt. Kenya, on the trail from west Kenya Forest Station to summit, about 2500 meters (*Mearns 1806*); vicinity of Wambugu, about 1860 meters (*Mearns 1220*); Kilimanjaro, alt. 6000 ft. (*Johnston 86*, the type?, in the Kew her-

barium); Kitoso (*Elliott 254*); Ukamba, Kibwezi (*Scheffler 128; 434*); Nairobi, alt. 6000 ft. (*Dowson 439*); 2 days march from Eldama ravine, 7–8000 ft. (*Whyte* in 1898).—BRITISH CENTRAL AFRICA: Chiradzulu Mt. (*Whyte*).—PORTUGUESE EAST AFRICA: Gazaland, alt. 3800 ft. (*Swynnerton 453*).—UGANDA: Mt. Elgon (*Snowdon 854*).—GERMAN EAST AFRICA:—Usambara (*Holst* in 1893; *8909*); Maranga (*Volkens 1443*); north of Lake Nyasa (*Stolz 2254*).—RHODESIA: Mazol Valley, alt. 4300 ft. (*Eyles 352*).—TRANSVAAL: Zoutpansberg (*Worsdell* in 1909).

Cuscuta Kilimanjari rukararana n. var.

Scalae nullae.

Similar to *C. Kilimanjari* in all respects excepting the scales, which are lacking in this variety.

Specimens examined.—GERMAN EAST AFRICA: Rukarara, alt. 1900 meters, on Acanthaceae (*Mildbraed 949*, the type, in the herbarium of the Botanical Institute at Dahlem). Known only from the type locality.

Subsection ODORATAE

Flowers subsessile or pedicellate. Perianth lobes obtuse, corolla lobes spreading or connivent. Stigmas often large, convoluted, or oval and slightly elongated. Styles somewhat subulate from a globose ovary (rarely slender in *C. odorata*). Scales mostly prominent.

C. cristata of subsection Platycarpa may be traced here because the base of the capsules are thin and break loose when pulled, thus simulating circumscission. The writer believes, however, that the capsules of *C. cristata* should not be considered as circumscissile.

KEY TO THE SPECIES

Anthers sessile, calyx mostly much shorter than the cylindrical corolla tube..... 59. *C. chilensis*

Anthers stalked

Corolla lobes upright or spreading, stigmas globose and often convoluted (not conic or oval)

Scales mostly not exceeding the middle of the corolla tube

Calyx shallow, not exceeding the middle of the corolla tube, lobes ovate-orbicular.....60. *C. Parodiana*

Calyx deep, often about enclosing the corolla tube, lobes ovate..... 61. *C. tucumana*

Scales mostly reaching the stamens (rarely shorter)

Styles mostly longer than the ovary

Corolla lobes mostly equaling the tube.....62. *C. odorata*

Corolla lobes mostly shorter than the tube.....*C. odorata Holwayana*

Styles about equal to, or shorter than, the ovary

Corolla lobes as broad as long, or broader, corolla campanulate, scales ovate *C. odorata botryoides*

Corolla lobes as broad as long, corolla globose, scales often truncated..... 63. *C. boliviana*

Corolla lobes connivent over the capsule, stigmas oval-elongated..64. *C. globiflora*

59. **Cuscuta chilensis** Ker-Gawler

Cuscuta chilensis Ker-Gawler, Bot. Reg. **7**: *pl. 603.* 1821.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 275. 1841.—also in DC. Prodr. **9**: 455. 1845.—Gay, Hist. de Chile **4**: 446. 1849.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 478. 1859.—Reiche, Fl. Chile **5**: 168. 1910.—Yuncker, Am. Jour. Bot. **9**: 562. *pl. 2. f. 10a–e.* 1922. Not Bertero.

Cuscuta odorata Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 276. *pl. 2. f. 4.* 1841.—also in DC. Prodr. **9**: 456. 1845 —Gay, Hist. de Chile **4**: 447. 1849. The specimens cited by Choisy, which are in the De Candolle herbarium, are *C. chilensis*, although Choisy's figure is not accurately drawn. Not Ruiz & Pavon.

Cuscuta odorata Poeppig, ex Choisy in DC. Prodr. **9**: 455. 1845.

Cuscuta aurea Philippi, Ann. Univ. Chile **90**: 224. 1895. Not Liebmann.

Stems medium. Flowers 5–7 mm. long, smooth, or infrequently slightly papillate, subsessile to sessile, in dense lateral clusters. Calyx much shorter than the corolla tube, lobes ovate, infrequently unequal, obtuse, slightly overlapping. Corolla cylindrical, lobes triangular-ovate, or infrequently oblong-ovate, obtuse or sometimes acute, much shorter than the corolla tube. Anthers linear-oblong, usually comparatively large, frequently purple, sessile or on short filaments. Scales shorter than the tube, bridged at about the middle, or lower, profusely fringed with medium-length processes. Styles subulate, mostly about equal to the globose-conic ovary, stigmas large and frequently more or less convoluted and reddish. Capsule circumscissile, globose or depressed-globose, or appearing conical because of the subulate styles, with the withered corolla about it; seeds two to four in each capsule, oval, 1.5–2 mm. long, hilum short.

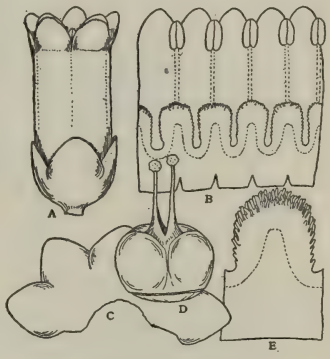

Fig. 59. C. chilensis.

This species is often confused with *C. odorata* in herbaria but may be distinguished with its longer corolla with comparatively shorter lobes and the large, subsessile or sessile anthers.

Common through central Chile and extending into western Argentina. On *Fuchsia*,

Baccharis, Muehlenbeckia, Lobelia, Cestrum, Foeniculum, 'on a Mayu bush,' 'growing over shrubs to 6 feet or more,' etc.

Specimens examined.—CHILE: (*Gay 195; Poeppig 261; Edmonston; Gillies; Maximowicz; Savatier 1751*); Limache (*Garaventa 1466, 1467, 1468; Loser 1469*); Santo Domingo (*Loser 1464*); Prov. of O'Higgins, Capada (*Pennell 12261*); Prov. Coquimbo (*Gay 816, 817*, cited by Choisy under his *C. odorata; Calddengh*); Valparaiso (*Harvey* in 1856; *Buchtien 4502, 4503; Andersson* in 1852; *Rusby 2001; Cuming 350; Wilkes; Gaudichaud 124;* in 1832; *Lechler 1501; Macrae* in 1825); Uspallata Pass (*Buchtien 1157, 4507*); Angol (*Kuntze* in 1892); Talca (*Philippi* in 1888); Concon (*Poeppig 90*); Lota (*Savatier 347; Lee* in 1888); Santiago (*Loser 1465, 1470, 1475; Philippi 656; Middleton* in 1907; *Ball* in 1882; *Germain* in 1855–56); Zapallar (*E.W.D. & Mary M. Holway* in 1920); Concepcion (*Mertens*); Panamavida, Linares (*E.W.D. & Mary M. Holway* in 1919); Casa Blanca (*Harvey* in 1856); San Cristobel (*Hastings 146; 291; 395*); Volcano Antuco (*Husbands 1015*).—ARGENTINA: (*Lorentz 214*); Prov. Mendoza (*Smith* in 1890–91). The type (not seen) was grown from Chilean seed in the Horticultural Society Gardens in London.

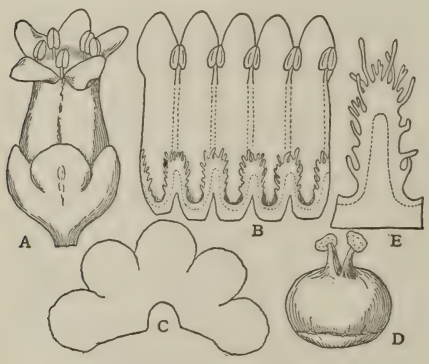

Fig. 60. C. Parodiana.

60. **Cuscuta Parodiana** n. sp.

Flores circ. 6 mm. longi, subsessiles, multifloribus cymosis inflorescentibus. Calyx dimidio aliquanto brevior quam corollae tubus. Scalae paulo minus longae quam dimidium tubi cylindrati, oblongae, fimbriatae. Capsula depresso-globosa, circumscissilis.

Stems medium. Flowers about 6mm. long, subsessile in many-flowered, cymose clusters. Calyx scarcely reaching the middle of the corolla tube: lobes overlapping, orbicular or ovate, obtuse, with somewhat membranous and denticulated margins, thicker and more or less fleshy in the median and basal part. Corolla cylindrical, becoming swollen in the basal portion about the ovary, saccate between the filament lines: lobes ovate, obtuse, about half as long as the tube. Stamens about two-thirds as long as the corolla lobes; slightly subulate filaments about equalling the oval anthers. Scales scarcely reaching the middle of the tube, fimbriated, oblong, bridged below the middle. Styles stoutish and about equal to, or shorter than, the depressed-globose ovary; stigmas large, convoluted and somewhat kidney-shaped. Capsule depressed-globose, circumscissile. Seeds not seen.

This species appears to be related to *C. chilensis* and *C. odorata*, but from both these species it is readily distinguished by the characters given above.

Specimens examined.—ARGENTINA: Tucuman (*Parodi 5243*, the type in herb. Parodi, a fragment in the author's herbarium). Known only from the type locality.

61. **Cuscuta tucumana** n. sp.

Flores 5–7 mm. longi, cymosis inflorescentibus. Calyx altus. Stamina breviora quam lobi; filamenta tenua et subulata. Scalae oblongae, dimidio aliquanto breviores quam tubus cylindratus. Ovarium globosum, stigmata magna. Capsula circumscissilis.

Stems slender to medium. Flowers 5–7 mm. long, on pedicels shorter than the flowers, in cymose clusters. Calyx deep and loose about the corolla, somewhat turbinate, about reaching the corolla sinuses, or somewhat shorter; lobes ovate, obtuse, overlapping. Corolla cylindrical when young, but soon enlarging in the lower part and becoming saccate between the filament attachments; lobes oblong-ovate, obtuse, becoming recurved, about half as long as the tube. Stamens shorter than the corolla lobes; anthers oval and about equal to the slenderly subulate filaments. Scales reaching the middle of the tube or above, oblong, bridged below the middle, fringed with slender processes. Styles subulate and about equaling the globose ovary; stigmas large, convoluted and somewhat kidney shaped. Matured fruit not seen, but the capsule would undoubtedly be circumscissile.

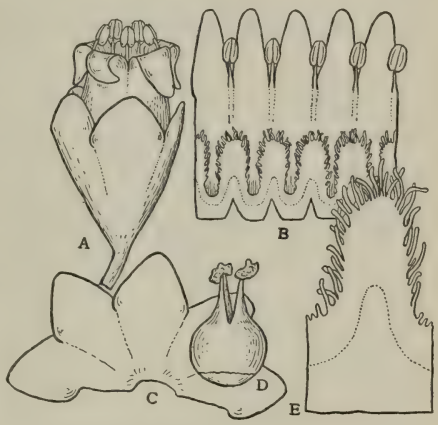

Fig. 61. C. tucumana.

This species is closely related to *C. Parodiana* and to *C. chilensis*. It differs from *C. Parodiana* in its much deeper calyx, more ovate calyx lobes, longer scales, etc. It may be distinguished from *C. chilensis* by its slender filaments and deep calyx.

Specimens examined.—ARGENTINA: Tucuman (Hauman *2997*, the type in herb. Parodi, a fragment in the author's herbarium). Known only from the type locality. Parasitic on *Ricinus communis*.

62. Cuscuta odorata Ruiz & Pavon

Cuscuta odorata Ruiz & Pavon, Fl. Peruv. **1**: 69. *pl. 105. f. a.* 1798.—Gay, Hist. Chile **4**: 447. 1849.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 477. 1859.—Reiche, Fl. Chile **5**: 168. 1910.—Yuncker, Am. Jour. Bot. **9**: 563. 1922. Not Choisy nor Poeppig.
?Nemepis odorata Rafinesque, Fl. Tellur. **4**: 91. 1836.
Cuscuta intermedia Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 275. *pl. 2. f. 3.* 1841; —also in DC. Prodr. **9**: 455. 1845. Not Schur.
Cuscuta fragrans Rusby, Mem. Torrey Club **6**: 85. 1896. Not Orphanides.
Cuscuta odorata typica Yuncker, Am. Jour. Bot. **9**: 564. *pl. 6. f. 21a–e.* 1922.

Stems medium. Flowers 4–6 mm. long, and about as wide in some specimens, often spotted or suffused with red or purple, reported as often having a vile odor, subsessile in dense, lateral clusters. Calyx shorter than, or, mostly about as long as the corolla tube, lobes ovate-orbicular, sometimes broader than long, frequently unequal, obtuse, overlapping. Corolla lobes upright, or spreading to reflexed, about as long as, or longer than, the campanulate or short cylindrical tube, ovate, obtuse, overlapping. Stamens reaching to about the middle of the corolla lobes, or shorter, filaments stout, subulate, and equal to the oval anthers. Scales large and prominent, about reaching the stamens or, rarely, shorter, densely fringed with medium to short processes, bridged at the middle or below. Styles subulate, mostly about as long as, or, less frequently, longer than the depressed-globose ovary, stigmas sometimes reddish. Capsule depressed-globose, circumscissile, carrying the withered corolla about it; seeds about 2 mm. long, hilum linear.

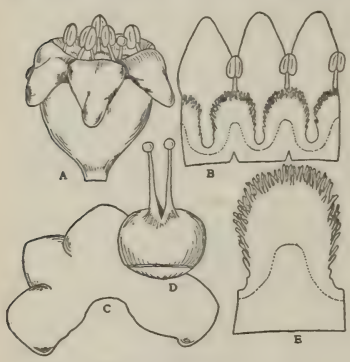

Fig. 62. C. odorata.

Western South America from Ecuador to Bolivia and northern Chile and in Brazil(?), on a variety of herbaceous and shrubby hosts.

Specimens examined.—Ecuador: Vicinity of Huigra, mostly on the Hacienda de Licay (*Rose & Rose 22256*); Loja (*Rose, Pachano & Rose 23272; Seeman 852*); Huigra, Prov. Chimborazo (*E.W.D. & Mary M. Holway* in 1920).—Peru: (*Hb. Pavon; Savatier 460; 1362; hb. Ruiz*, taken to represent the type, a specimen in the herbarium of the Missouri Botanical Garden; *Martinet 1027; Gay 2168; Capt. Wilkes; Matthew 486*); Carabaya (*Weddell 4693*); Lima (*Weberbauer 73; 160; 1610?* in this specimen the stamens are subsessile; *Nation* in 1862; *McBride 5962*); Along Rio Chillon, above Obrajillo, alt. 2800–3200 meters (*Pennell 14382*); Dept. Ancachs (*Weberbauer 2860*); 12 miles south of Panao, alt. 10000 ft. (*McBride & Featherstone 2203*); Mito, alt. 9000 ft.

(*McBride & Featherstone 1378*); Chinchapalca, alt. 9500 ft. (*McBride & Featherstone 1587*); Yanahuanca, alt. 10000 ft. (*McBride & Featherstone 1229*); Viso, alt. 9000 ft. (*McBride & Featherstone 756*); Matucana, alt. 8000 ft. (*McBride & Featherstone 104; 148; 465*); Huanuco, alt. 7000 ft. (*McBride & Featherstone 2377*).—CHILE: Desert of Atacama (*Morong 1143*); Prov. Coquimbo (*Gay 38; 815*, the type of Choisy's *C. intermedia*, in the DeCandolle herbarium); Caldera (*Stübel 34*).—BOLIVIA: Sorata (*Bang 1303*, the type of *C. fragrans; Williams 829*).—BRAZIL: Minas Geraes (*St. Hilaire D482*, fragmentary, but appears to be this).

Cuscuta odorata squarrulosa n. var.

Apices calycis loborum abrupte divergentes. Corollae lobi vulgo breviores quam tubus. Filamenta breviora quam antherae.

Sepals mostly with the tips abruptly spreading. Corolla lobes mostly shorter than the tube. Filaments shorter than the anthers.

Specimens examined.—PERU: Dept. Lima, Rio Blanco, alt. 3,000–3,500 meters (*Killip & Smith 21684*, the type, in the U. S. Nat. Herb.).

Cuscuta odorata Holwayana Yuncker

Cuscuta odorata Holwayana Yuncker, Am. Jour. Bot. **9**: 564. *pl. 4. f. 21f.* 1922.

Corolla lobes half to two-thirds as long as the tube, scales narrow, oblong or triangular, more sparingly fringed than in *C. odorata*, scarcely reaching the stamens. Capsule globose, not strikingly depressed.

Peru, Chile, Bolivia, and Argentina.

Specimens examined.—BOLIVIA: Sorata (*E.W.D. & Mary M. Holway* April 12, 1920, the type, in the author's herbarium; *Mandon 1480*, in part).—PERU: Muña, alt. 7000 ft. on herbs (*McBride 3993*, this specimen is papillate and may be distinguished as forma **papillosa**).—CHILE: Prov. Coquimbo (*Gay 37*).—ARGENTINA: Prov. Jujuy (*Claren 11792*).

Cuscuta odorata botryoides Engelmann

Cuscuta odorata botryoides Engelmann, Trans. Acad. Sci. St. Louis **1**: 477. 1859.—Yuncker, Am. Jour. Bot. **9**: 564. *pl. 4. f. 21g.* 1922.

Corolla lobes about half as long as the tube. Calyx lobes uneven. Capsule large, depressed-globose, styles short, intrastylar aperture large and gaping.

This variety is closely allied with *C. globiflora* but the corolla lobes are not connivent as in that species nor are the stigmas conic or compressed.

Southern Brazil.

Specimens examined.—Southern BRAZIL: (*Lobb 49*, the type, in the Kew herbarium); Santa Catharina (*Mueller 439*).

63. **Cuscuta boliviana** Yuncker

Cuscuta boliviana Yuncker, Am. Jour. Bot. **9**: 565. *pl. 1. f. 3a–e.* 1922.

Stems medium to slender. Flowers 2.5–4 mm. long, subsessile or sessile in dense, few-flowered, globular clusters. Calyx nearly as long as the corolla tube,

lobes ovate-orbicular, obtuse, overlapping, infrequently some lobes strongly carinate, edges slightly uneven, but not fimbriated. Corolla campanulate, soon becoming somewhat globular about the developing capsule, lobes upright or spreading, ovate, obtuse, shorter than the tube. Scales reaching the stamens, oblong, often truncated, moderately fringed with medium-length processes, particularly about the top, bridged below the middle. Anthers about equaling, or shorter than, the stoutish filaments. Ovary globose, slightly thickened about the style bases, styles stout and slightly subulate, shorter than the ovary. Capsule depressed-globose, circumscissile, with the withered corolla about it, but not covering the partly exposed capsule; seeds about 1.5 mm. long, ordinarily four in each capsule, reddish, hilum short, oblong, oblique.

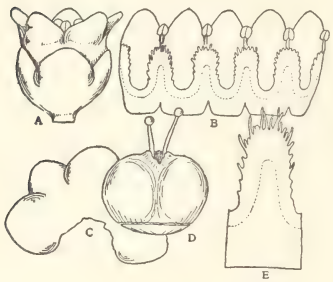

Fig. 63. C. boliviana.

This species differs from *C. globiflora*, with which it is closely allied, by having smaller flowers, spreading corolla lobes, partially exposed capsules, shorter styles and more globose stigmas. It differs from *C. cristata* in the possession of a circumscissile capsule, larger stigmas, longer styles, broader calyx lobes and sessile flowers.

Specimens examined.—Bolivia: Padcayo, alt. 2100 meters on *Baccharis ulicina* (*Fiebrig 2523*, the type, in the Buchtien herbarium). Known only from the type locality.

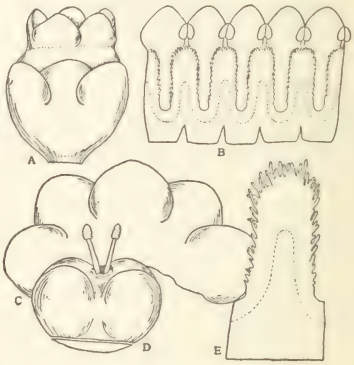

Fig. 64. C. globiflora.

64. **Cuscuta globiflora** Engelmann

Cuscuta globiflora Engelmann, Trans. Acad. Sci. St. Louis 1: 520. 1859.—Yuncker, Am. Jour. Bot. 9: 564. *pl. 2. f. 9a–e.* 1922.
Cuscuta grossa Engelmann in herb.

Stems medium. Flowers 4–5 mm. long and nearly as broad, texture thick and fleshy, sessile in few- to many-flowered, globular clusters, each flower

usually subtended by a large, ovate-orbicular bract, perianth segments commonly finely fimbriated with delicate, filamentous processes. Calyx deep, reaching nearly to the corolla lobes, lobes orbicular, overlapping. Corolla urceolate, lobes ovate-orbicular, overlapping, about half as long as the tube, upright, becoming urceolate in fruit. Stamens short, filaments stout and shorter than the oval anthers. Scales large, reaching the stamens, bridged at about the middle or below, fringed with short or medium-length processes. Styles subulate, about equal to the globose, depressed ovary, stigmas more or less conic or flattened and convoluted, not round or globose, in some specimens the stigmas are not much larger in diameter than the styles. Capsule depressed-globose, circumscissile, with the withered corolla about it; seeds about 1.5 mm. long, two to four in each capsule, sometimes red, hilum short, oblong.

The connivent corolla lobes and peculiar form of stigmas easily identify this species.

Andes of Bolivia and Argentina, mostly about 8–10,000 feet high. On various herbaceous and woody hosts.

Specimens examined.—Bolivia: (*Fiebrig* in 1903–04; *Buchtien 113*); Cuzco, alt. 11,380 ft. (*Pentland,* the type, in the Kew herbarium); Cotaña (*Buchtien 133; 4504*); La Paz (*Bang 115,* in part; *Buchtien 753; 3235; Rusby 2004; E.W.D. & Mary M. Holway* in 1920); between Palca and LaPaz (*Pflanz 382*); Sorata (*Bang 1304; Mandon 1480,* in part).—Argentina: Prov. de Catamarca, Dept. de Andalgala (*Jörgensen 1702*).

Subsection Subulatae

Cuscuta subsection *Subulatae* Engelmann, Trans. Acad. Sci. St. Louis **1**: 476. 1859, in part.

Styles very subulate and mostly widely divergent at maturity, with a widely gaping intrastylar opening. Perianth parts obtuse. Scales prominent. The species included here show the most strikingly subulate styles found in the genus. Known only from Mexico and Central America.

KEY TO THE SPECIES

Calyx lobes mostly much wider than long (at maturity), pistil and capsule mostly with a thick, prominent stylopodium, stigmas large and convoluted; scales ovate, about reaching the stamens, or somewhat exserted.....65. *C. rugosiceps*

Calyx lobes orbicular or deltoid-ovate, about as broad as long, more deeply divided, pistil and capsule without so marked a stylopodium and stigmas not strikingly enlarged or convoluted

Corolla lobes shorter than the tube, scales ovate and about reaching the stamens 66. *C. jalapensis*

Corolla lobes mostly exceeding the short tube, scales mostly exserted, broadly truncated, sometimes bifid, infrequently ovate.....67. *C. mitraeformis*

65. **Cuscuta rugosiceps** Yuncker

Cuscuta rugosiceps Yuncker, Ill. Biol. Monogr. **6**: 117. *f. 1, 70, 155.* 1921.

Stems coarse. Flowers glabrous, 4–6 mm. long, sessile, in compact clusters. Calyx large, campanulate, nearly as long as the corolla tube, lobes short, broader than long in most specimens, unequal, obtuse, somewhat lobed at the sinuses, overlapping, frequently carinate. Corolla lobes ovate, obtuse, spreading, shorter than the campanulate tube. Scales reaching the filaments, fringed, bridged at about the middle, or below. Stamens shorter than the lobes, anthers oval, about equal to the somewhat subulate filaments. Ovary small, somewhat conic, tapering into the subulate styles, stigmas large and more or less convoluted. Capsule circumscissile, with a very thick apex giving the capsule a conic appearance, surrounded by the withered corolla; seeds usually four in each capsule, round, compressed, about 1.4 mm. long, hilum at one end, short elliptical or but a dot; umbilical area finely striated.

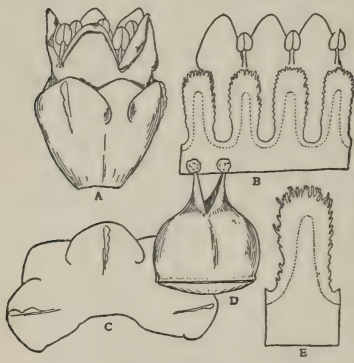

Fig. 65. C. rugosiceps.

Mexico and Guatemala.

Specimens examined.—Mexico: Cieneguilla (*Smith 828*); State of Oaxaca, Sierra de San Felipe (*Pringle 4967*, the type in the U. S. National Herbarium as sheet 252,219); Jalisco, Volcano of Colima (*M.E. 347*).—Guatemala: Dept. Quiché, San Miguel Uspautan, alt. 2000 meters (*Heyde & Lux 2912*).

66. **Cuscuta jalapensis** Schlechtendal

Cuscuta jalapensis Schlechtendal, Linnaea **8:** 515. 1833.—Engelmann, Trans. Acad. Sci. St. Louis **1:** 478. 1859.—Yuncker, Ill. Biol. Monogr. **6:** 117. *f. 26, 65, 66.* 1921.

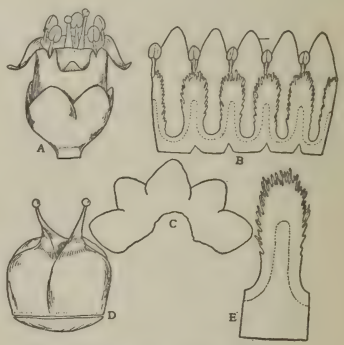

Fig. 66. C. jalapensis.

Stems medium. Flowers 3–5 mm. long, on pedicels as long as, or shorter than, the flowers, in dense clusters. Calyx mostly shorter than the campanulate corolla, lobes overlapping, ovate, obtuse, somewhat thickened and verrucose along the middle. Corolla lobes ovate, obtuse, shorter than the tube, upright to reflexed. Scales ovate-oblong, about as long as the tube, or exserted, fringed.

Stamens shorter than the lobes, anthers ovate, about equaling the slightly subulate filaments. Styles strongly subulate, mostly shorter than the globose-conic ovary. Capsule circumscissile, globose, surrounded by the withered corolla, the conical styles widely divergent; seeds about 1.5 mm. long, ovate, hilum narrow, transverse.

Southern Mexico to Guatemala.

Specimens examined.—MEXICO: (*Mueller* in 1853; *Graham 250*); Jalapa (*Schiede 152*, the type number, a specimen in the herbarium of the Missouri Botanical Garden; *Chrismar*); Puebla (*Purpus 5708; Seler 3781*); Vera Cruz (*Nelson* in 1893); Orizaba (*Bourgeau 3267*), climbing trees 15 feet (*Fisher 271*).– GUATEMALA: Dept. San Marcos, alt. 2300 meters (*Salas 358*); Dept. Chimaltenango, Bueno Vista, 8–9,000 ft. (*Skutch 98*, on *Gaultheria*).

67. **Cuscuta mitraeformis** Engelmann

Cuscuta mitraeformis Engelmann, in Hemsley, Diag. Pl. Nov. 54. 1880.—Yuncker, Ill. Biol. Monogr. **6**: 116. *f. 27, 71, 141, 154.* 1921.

Stems coarse. Flowers 3–5 mm. long, on short pedicels in compact, globular clusters. Calyx lobes about as long as the corolla tube, ovate, obtuse, unequal, overlapping, the larger lobes often strongly and unevenly carinate, the others less so. Corolla lobes ovate, obtuse, about as long as, or exceeding, the campanulate tube, spreading to reflexed. Scales oblong, mostly somewhat truncated, bifid, or less commonly ovate, as long as the tube, deeply fringed. Stamens shorter than the lobes, filaments subulate, equal to the oblong anthers, or longer. Ovary conical, styles shorter than the ovary, subulate, continuing the outlines of the ovary, stigmas capitate, sometimes slightly convoluted. Capsule 5–8 mm. long, circumscissile, with the withered corolla about it, styles widely divergent, as horns; seeds oval, about 2 mm. long, angled, hilum short, oblong, transverse.

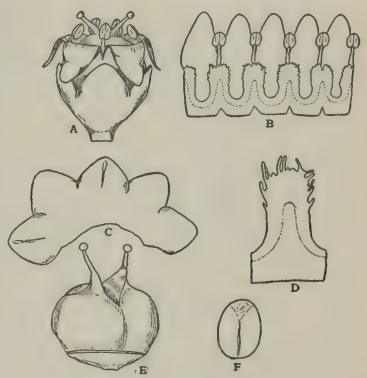

Fig. 67. C. mitraeformis.

Central and southern Mexico.

Specimens examined.—MEXICO: (*Ehrenberg 840; Schaffner 516; Bustamente 83*); Enroute San Luis Potosi to Tampico (*Palmer* Dec. 1878 to Feb. 1879, the type, in the herbarium of the Missouri Botanical Garden); Puebla, alt. 2205 meters (*Arsène 2271; Nicolas* in 1909). Chiahuahua, Sierra Madre (*Townsend & Barber 294; Pringle 1342*);

Rocky hills near Chihuahua (*Pringle 291*); Vera Cruz, Jalapa (*Scheide* in 1829; *Endlich 1399*); Coatepec (*Barnes & Land 567*); Michoacan, near Lake Chapala (*Pringle 4330*); San Luis Potosi (*Palmer 631*); Alvarez (*Palmer 137*).

Subsection Ceratophorae

Calyx deeply divided, lobes distinct or nearly so, thick and fleshy, mostly denticulate, eroded or fimbriated, styles subulate. *C. chapalana* with its acutish lobes unites this group with subsection Acutilobae. *C. strobilacea* is probably more closely related to *C. erosa* of this subsection than it is to the other members of the subsection LEPIDANCHOPSIS, in which it is placed.

KEY TO THE SPECIES

Calyx lobes orbicular, mostly not bearing horn-like projections at the top
- Flowers sessile, corolla lobes orbicular.....68. *C. blepharolepis*
- Flowers pedicelled, corolla lobes oval-ovate.....69. *C. erosa*

Calyx lobes oval-ovate, calyx and corolla lobes mostly bearing horn-like projections near the otherwise obtuse apex (sometimes the projection is at the top, making it cuspidate)
- Scales large, about reaching the filaments, bridged at about the middle..... 70. *C. Boldinghii*
- Scales much reduced and scarcely bridged.....71. *C. chapalana*

68. **Cuscuta blepharolepis** Welwitsch

Cuscuta blepharolepis Weltwitsch mss. in herb., ex Hiern, Catalogue Welw. Afr. Pl. **1**[3]: 743. 1898.

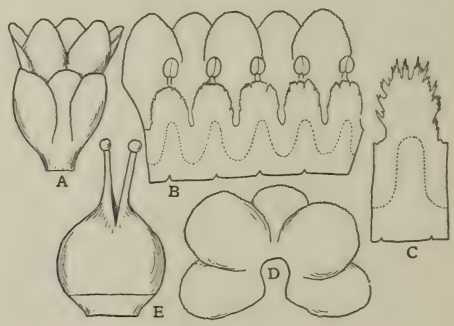

Fig. 68. C. blepharolepis.

Stems medium. Flowers 4–5 mm. long, thickish and more or less fleshy, sessile, in dense clusters?. Calyx enclosing the corolla tube, lobes orbicular, cupped, very broadly overlapping, obtuse, edges thin and serrulated, lobes about distinct. Corolla lobes orbicular-ovate, obtuse, edges serrulated, equal

to, or greater than, the campanulate tube, upright to spreading. Scales exserted, ovate, profusely fimbriated, bridged above the middle, prominent, nearly reaching the anthers, fimbriae irregular. Stamens shorter than the lobes, filaments stoutish and longer than the oval anthers. Styles stoutish and more or less subulate, equaling, or longer than, the globose-conic ovary. Capsule globose, circumscissile, enveloped by the withered corolla. Seeds not seen.

This is a well differentiated but rare species, known only from the type locality.

Specimens examined.—Dist. Pungo Andongo, Angola, Africa. 'In the more elevated wooded bushy parts of Pedra de Cabondo, infesting shrubs and neighboring herbs, such as *Cissus*, *Paullinia*, and Urticaceae, with a very dense saffron coloured network: fl. & fr. beginning of Dec. 1856 and April 1857' (*Welwitsch 6140*, the type, a specimen in the herbarium of the British Museum).

69. **Cuscuta erosa** Yuncker

Cuscuta erosa Yuncker, Ill. Biol. Monogr. **6**: 116. *f. 8, 61.* 1921.

Stems medium. Flowers smooth, about 3–4 mm. long, 5-parted, on pedicels as long as, or shorter than, the flowers, closely clustered about the host in cymose panicles, somewhat reddish brown. Calyx lobes orbicular, obtuse, denticulated, cupped, overlapping, membranous at the edges, fleshier in the median portion, nearly distinct, shorter than, or equaling, the corolla tube, sometimes with a short, dorsal projection. Corolla lobes upright or spreading, about as long as, or slightly shorter than, the campanulate tube, ovate-oblong, obtuse, some flowers possessing a small, horn-like projection at the end of a thickened, vein-like elevation on the dorsal surface of each lobe near the apex. Scales broad, fringed, about equaling the tube, bridged at about the middle. Stamens shorter than the lobes, anthers oval, about equal to the subulate filaments. Styles subulate, longer than the globose ovary. Capsule globose, circumscissile, usually one seeded, styles stouter and becoming divergent, carrying the withered corolla about the middle or at the top; seeds about 1.5 mm. long, globose, ovate, compressed, with a short, linear line or a dot for the hilum.

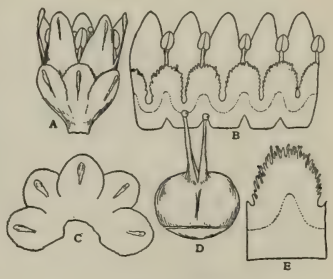

Fig. 69. C. erosa.

Northwestern Mexico and southern Arizona.

Specimens examined.—Arizona: Santa Rita Mts., south of Tucson (*Engelmann* in 1880; *Thornber 7219; 7220*).—Mexico: Sonora (*Palmer* in 1869, the type, in the U. S. National Herbarium as sheet 49,836).

70. Cuscuta Boldinghii Urban

Cuscuta Boldinghii Urban, Repert. Spec. Nov. **16:** 38. 1919.
Cuscuta partita Boldingh, Fl. Nederl. West-Ind. 326. 1913; Fl. Curaçao 87. 1914, ex Urban, Repert. Spec. Nov. **16:** 38. 1919. Not Choisy.
Cuscuta ceratophora Yuncker, Ill. Biol. Monogr. **6:** 118. *f. 29, 72.* 1921.

Stems slender. Flowers 3–4 mm. long, subsessile or sessile, in compact clusters Calyx lobes longer than, or about equaling, the corolla tube, distinct, or but slightly united, overlapping, oblong or oval, or somewhat spatulate, obtuse, with uneven edges and a mucronate tip, or, more commonly, with the apex obtuse and with a horn-like projection from its dorsal surface near the tip. Corolla lobes about as long as the campanulate tube, upright to spreading, oblong or oval, obtuse, irregularly toothed at the apex and with a subapical horn-like projection. Stamens shorter than the corolla lobes, anthers small, oval-ovate, slightly versatile and shorter than the somewhat subulate and rather stout filaments. Scales reaching the filaments, oblong or broadly ovate, fringed with short processes, bridged at about their middle. Styles stout and subulate, much longer than the small, globose ovary, stigmas capitate. Capsule globose, circumscissile, carrying the withered corolla about the top, styles subulate and somewhat divergent; seeds oval, about 1 mm. long, hilum short, oblong, perpendicular.

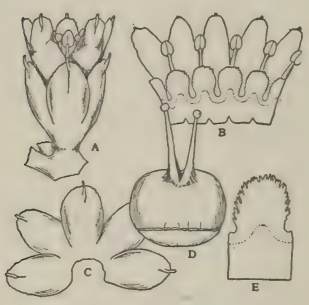

Fig. 70. C. Boldinghii.

This is one of the few species bearing horn-like projections on the perianth lobes.

Central Mexico to Honduras and in the West Indies.

Specimens examined.—Mexico: (*Schott 74; 902*); Yucatan, Merida (*Schott 413; 416*); States of Michoacan and Guerrero (*Langlassé 438*, the type of *C. ceratophora*); Jalapa (*Chrismar*); Vera Cruz (*Mueller* in 1853; *Purpus 8405; Fisher 110*).—West Indies: Bonaire (*Boldingh 7379*, the type, in herb. Urban, in the Botanical Institute at Dahlem); Curaçao (*Suringar*); Haiti (*Ekman 10455*).—Central America: Honduras (*Thieme 207*).

71. Cuscuta chapalana Yuncker

Cuscuta chapalana Yuncker, Ill. Biol. Monogr. **6:** 118. *f. 11, 69.* 1921.

Stems medium. Flowers 3–4 mm. long, subsessile, in compact, cymose clusters. Calyx deeply divided, shorter than, or equaling, the corolla tube,

lobes ovate, acutish, thickened along the midportion of the dorsal surface which bears a short projection near the apex. Corolla cylindrical, slightly baggy in the basal region, lobes shorter than the tube, somewhat overlapping, erect to spreading, ovate, acutish, with a prong-like dorsal projection near the apex. Scales very small, reaching not more than the middle of the tube, oblong, with a few short processes at the truncated apex, scarcely bridged. Stamens shorter than the lobes, filaments shorter than the somewhat oval, subsessile anthers. Styles subulate, as long as, or shorter than, the small, globose-conic ovary, stigmas capitate. Fruit not seen, but the capsule would evidently be circumscissile.

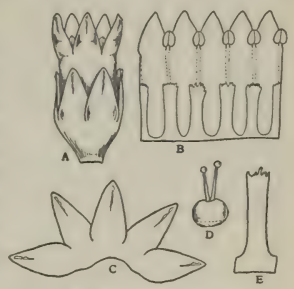

Fig. 71. C. chapalana.

Specimens examined.—MEXICO: Mountains near Lake Chapala, Jalisco (*Pringle 5349*), the type, in the U. S. National Herbarium as sheet 305,846). Known only from the type locality.

Subsection ACUTILOBAE

Corolla lobes, and often also the calyx lobes, acute. Styles subulate from a globose ovary; stigmas globose or, in *C. purpurata*, ligulate.

KEY TO THE SPECIES

Calyx lobes slightly, or not at all, overlapping
- Corolla lobes about half as long as the tube, flowers red ..... 72. *C. rubella*
- Corolla lobes nearly equaling the tube
  - Flowers yellow or reddish, not fleshy, scales narrow ..... 73. *C. lucidicarpa*
  - Flowers purple, fleshy, scales wider ..... 74. *C. bella*

Calyx lobes overlapping, flowers mostly larger
- Stigmas ligulate, calyx lobes obtusish ..... 75. *C. purpurata*
- Stigmas never ligulate, calyx lobes mostly acute
  - Flowers subsessile, or sessile
    - Flowers 2–3.5 mm. long, corolla lobes longer than the corolla tube ..... 76. *C. xanthochortos*
  - Flowers 5–10 mm. long, corolla lobes shorter than the tube
    - Corolla lobes oblong, stamens sessile ..... 77. *C. paitana*
    - Corolla lobes triangular-ovate, stamens mostly stalked ..... 78. *C. foetida*
  - Flowers mostly stalked, 2–3 mm. long ..... 79. *C. acutiloba*

72. **Cuscuta rubella** Yuncker

Cuscuta rubella Yuncker, Bull. Torrey Club 50: 278. *f. 2.* 1923.

Stems slender. Flowers mostly red, 2–2.5 mm. long, sessile, in dense, small,

few-flowered glomerules. Calyx red, somewhat fleshy, definitely shorter than the corolla tube, deeply divided and loose about the corolla, lobes more or less uneven, oval, obovate, or sometimes spatulate, obtuse. Corolla reddish in the exposed portion, more or less globular, furrowed along the stamen attachments, more or less papillate or verrucose in the basal part of the tube, lobes much shorter than the tube, triangular, acute, upright or spreading. Anthers large, oval, subsessile on very short filaments, or sessile. Scales not reaching the anthers, narrowly oblong, fringed with few, short processes, bridged low. Subulate styles tapering from the ovary giving it a conical appearance. Matured capsules not seen, but it is evident that they would be circumscissile and surrounded by the withered corolla.

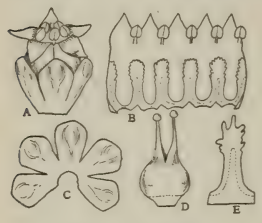

Fig. 72. C. rubella.

This is a very pretty species and closely allied with *C. lucidicarpa*, but differs from it in having smaller, sessile flowers, with fleshy, deeply divided calyx, and with oval, obovate, or spatulate calyx lobes, and with the corolla lobes short and acute.

Specimens examined.—PERU: Matucana, 8000 feet high, dry eastern hillside on various herbs (*McBride & Featherstone 371*, the type in the Field Museum herbarium as sheet 516,906). Known only from the type locality.

73. **Cuscuta lucidicarpa** Yuncker

Cuscuta lucidicarpa Yuncker, Bull. Torrey Club **50**: 277. *f. 1.* 1923.

Stems slender. Flowers 3–4 mm. long, more or less papillate, subsessile or sessile, borne singly or in few-flowered clusters. Calyx mostly red or yellowish, scarcely enclosing the corolla tube, divided to the middle, not thick or fleshy, lobes triangular-ovate, obtuse or acutish, slightly, or not at all, overlapping. Corolla campanulate, or somewhat globular, lobes sometimes reddish, triangular-ovate, acutish or obtuse, connivent or spreading, scarcely as long as the tube. Anthers oval and subsessile on short, stout filaments. Scales reaching the stamens, or slightly shorter, narrowly oblong, fringed with short processes, bridged low. Styles subulate and tapering from the conical ovary. Capsule depressed-globose, becoming very thin and semi-transparent, circumscissile, carrying the withered corolla about the upper part; seeds four, triangular, hilum short.

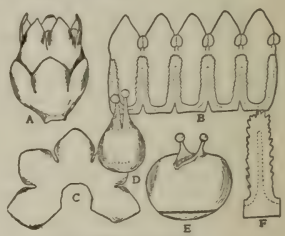

Fig. 73. C. lucidicarpa.

Specimens examined.—PERU: Tarma, alt. 7000 ft., on various herbs (*McBride & Featherstone 1035*, the type, in the Field Museum herbarium as sheet 517,559; *Killip & Smith 21843, 21858, 21909*).

74. **Cuscuta bella** n. sp.

Flores 4–5 mm. longi, purpurei aut crocei, carnosi, papillati, sessiles, in glomerulibus paucifloribus. Calycis lobi leviter, imbricati. Corolla campanulata, lobis triangulari-acutis. Scalae oblongae, tangentes antheras. Styli subulati. Ovarium conicum.

Stems slender to medium. Flowers 4–5 mm. long, purple or reddish, fleshy, papillate, sessile, in few-flowered (mostly 3–6) glomerules. Calyx nearly en-

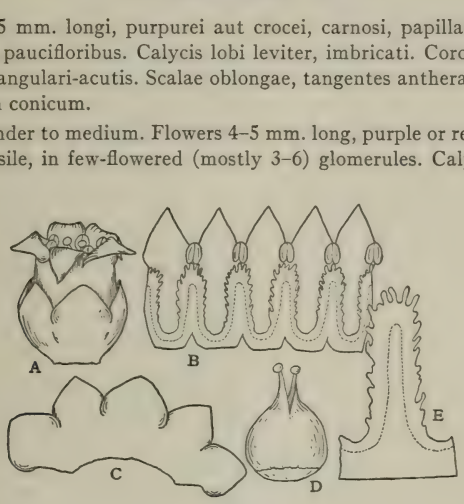

Fig. 74. C. bella.

closing the corolla tube, or, infrequently, somewhat shorter, divided to about the middle; lobes triangular-ovate, acute or obtusish, slightly overlapping. Corolla campanulate; lobes triangular-ovate, acute, spreading, somewhat shorter than the tube. Oval anthers subsessile, yellow. Scales reaching the anthers, oblong, fringed with short processes, bridged low. Subulate styles shorter than and tapering into the conical ovary. Conic capsule circumscissile. Seeds not seen.

This species resembles *C. rubella* in some respects, but differs mainly in its larger flowers with less deeply segmented calyx lobes which are also more broadly ovate and overlapping. The corolla also differs in its proportionately longer lobes and larger scales. From *C. lucidicarpa* it is distinguishable with its somewhat larger, fleshy, purple flowers and broader scales. The flowers of this species are very attractive with their purple corollas and yellow anthers.

Specimens examined.—PERU: Dept. Junín: Tarma, alt. 3000–3200 meters (*Killip & Smith 21827*, the type in the U. S. Nat. Herb.).

75. **Cuscuta purpurata** Philippi

Cuscuta purpurata Philippi, Ann. Univ. Chile **90**: 225. 1895.

Flowers about 4 mm. long, subsessile on short pedicels, in compact clusters, often purplish, slightly papillate. Calyx loose about the corolla, lobes overlapping, deeply divided, ovate, obtuse or acutish. Corolla lobes upright to spreading, oval-ovate, acute, about equal to the campanulate tube. Oval anthers subsessile. Scales oblong, fringed with short processes, reaching the stamens, bridged below the middle. Styles stoutish and somewhat subulate, longer than the globose or slightly conic ovary, stigmas ligulate. Capsule and seeds not seen.

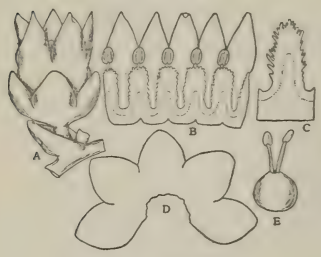

Fig. 75. C. purpurata.

This species resembles *C. odorata*, but is distinguished from that species by the ligulate stigmas, acute lobes, and subsessile anthers.

Specimens examined.—CHILE: Atacama (*Philippi*, the type?, in the herbarium of the Botanical Institute at Dahlem). A specimen collected in Prov. Taltal, Chili (*Werdermann 852*, in the Delessert herbarium) differs from the type in not being purple and with more globose stigmas. This may be designated as *C. purpurata* forma **pallida**, n. form.

76. **Cuscuta xanthochortos** Martius

Cuscuta xanthochortos Martius, in Engelmann, Trans. Acad. Sci. St. Louis **1**: 486. 1859. —Progel, in Martius, Fl. Bras. **7**: 379. *pl. 126. f. 5.* 1871.—Yuncker, Am. Jour. Bot. **9**: 567. 1922.

Cuscuta corniculata racemulosa Engelmann, Trans. Acad. Sci. St. Louis **1**: 504. 1859.

Cuscuta xanthochortos typica Yuncker, Am. Jour. Bot. **9**: 567. *pl. 3, f. 18a–e.* 1922.

Stems slender. Flowers about 2 mm. long, subsessile in much branched, racemose, or cymose, clusters, bracts often large and prominent, not infrequently enclosing and surrounding the flower. Calyx scarcely as long as the corolla tube, or equaling it, lobes triangular, acutish, or obtuse, overlapping at the base, angled at the sinuses and often revolute at the somewhat lobed base, thickened at the point. Corolla campanulate, shallow, lobes mostly longer than the tube, reflexed, triangular-ovate, thickened at the point, acute, tips commonly inflexed, sometimes papillate and fleshy. Stamens shorter than the lobes,

the oblong-oval anthers shorter than, or equaling, the subulate filaments. Scales reaching the stamens, or infrequently shorter, bridged at about the middle, or, mostly, below, fringed with short processes. Styles thickish and slightly subulate, or slender, longer than the globose ovary which is thickened at the top in the form of a collar about the style bases, often with four projections, two on each side of the intrastylar opening close together, giving the ovary a two-horned appearance. Capsule globose, circumscissile, carrying the withered corolla about it. Matured seeds not seen.

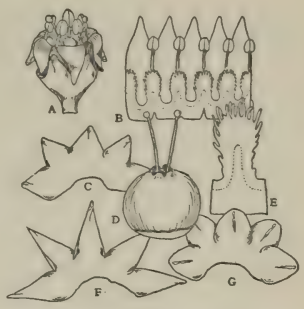

Fig. 76. A-E, C. xanthochortos; F, var. lanceolata; G, var. carinata.

Southern Brazil, Uruguay and Argentina.

Specimens examined.—ARGENTINA: (*Niederlein 1308*).—BRAZIL: Porto Alegre, Rio Grande de San Pedro (*Father Joannes de Sta. Barbara*, the type, in herb. Martius, a fragment in the herbarium of the Missouri Botanical Garden); Southern Brazil (*Sellow 2489 & 3621*, types of *C. corniculata racemulosa*, in the herbarium of the Botanical Institute at Dahlem); Rio Grande do Sul (*Malme 1002; 1416*); Neu-Württemberg (*Bornmüller 641*).—URUGUAY: Bords du Rio Negro (*Gibert 283*).

Cuscuta xanthochortos carinata n. comb.

Cuscuta trichostyla carinata Yuncker, Am. Jour. Bot. **9**: 572. *pl. 3, f. 15f–g.* 1922.

Flowers larger (3–4 mm. long), calyx lobes broadly triangular-ovate, overlapping, enclosing the corolla. Corolla lobes ovate-oblong.

Paraguay and northern Argentina.

Specimens examined.—PARAGUAY: Cordillera de Altos (*Fiebrig 432; 487*, the type, in the Gray herbarium).—ARGENTINA: Concordia (*Arechavaleta 82*).

Cuscuta xanthochortos lanceolata Yuncker

Cuscuta xanthochortos lanceolata Yuncker, Am. Jour. Bot. **9**: 568. *pl. 3. f. 18f–g.* 1922.

Flowers 3–3.5 mm. long, subsessile, in dense clusters. Calyx and corolla lobes ovate-lanceolate, acute. The inflorescence is usually more dense and the corolla more cylindrical or funnel-form than in *C. xanthochortos*.

Paraguay.

Specimens examined.—PARAGUAY: (*Page* in 1854; *Balansa 2064; Anisits 462*); Maracayú Mountains (*Hassler 5113*, the type, in the herbarium of the Botanical Institute at Dahlem; *4694*); L'Assomption (*Balansa 2066*); between the rivers Apa and Aquidaban (*Fiebrig*); Trinidad-Asuncion on *Vernonia* sp. (*Fiebrig 6705*).

77. **Cuscuta paitana** n. sp.

Caules medii aut crassi. Flores 8–10 mm. longi. Calyx brevior quam corolla, alte divisus, lobi ovati aut elliptici, acuti, imbricati. Corollae lobi oblongi acuti, multo breviores quam cylindratus-globosus tubus. Scalae spatulatae, fimbriatae circa cacumen. Antherae oblongae sessiles. Styli subulati, aequantes aut longiores quam ovarium globosum.

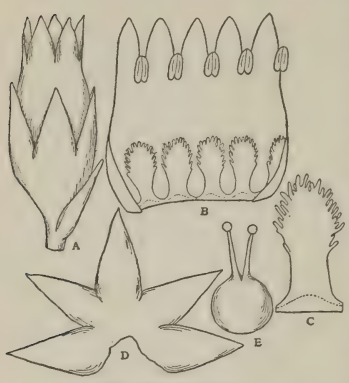

Fig. 77. C. paitana.

Stems medium to coarse. Flowers 8–10 mm. long, closely subtended by a large, oval bract, in few-flowered, or dense, fascicled, cymose clusters. Calyx shorter than the corolla, deeply divided, lobes ovate or elliptical, sharply acute, overlapping. Corolla lobes oblong, acute, not overlapping, much shorter than the cylindrical-globose tube. Scales scarcely reaching the middle of the tube, spatulate, fringed about the top, bridged very low. Oblong anthers sessile. Styles subulate, equaling, or longer than, the globose ovary, stigmas large. Capsule not seen, but would probably be enveloped by the corolla.

The specimen examined was very poor and damaged by insects, but enough of the flowers were present to show that this represents a very distinct species. Whether the capsule is circumscissile or not could not be determined, but the specimen shows obvious relationship with other members of this subsection so that I feel warranted in tentatively placing it here. It seems to be most nearly related to *C. foetida*, but differs from that species in the shape and proportion of its calyx and corolla lobes and by its sessile anthers.

Specimens examined.—Peru: Prov. Paita, Talara, 'on many species of herbs' (*Haught 11*, the type, in the U. S. National Herbarium as sheet 1,281,720).

78. **Cuscuta foetida** Humboldt, Bonpland & Kunth

Cuscuta foetida Humboldt, Bonpland & Kunth, Nov. Gen. et Sp. Pl. **3**: 122. (96 in folio edition). 1818.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 285. 1841; also in DC. Prodr. **9**: 460. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 478. 1859.—Yuncker, Am. Jour. Bot. **9**: 565. 1922. Not Hooker & Arnott.

Cuscuta corymbosa Jussieu in herb. Not Ruiz & Pavon nor Choisy.

Cuscuta foetida typica Yuncker, Am. Jour. Bot. **9**: 566. *pl. 5. f. 24a–e.* 1922.

Stems medium to coarse. Flowers 4–7 mm. long, sessile, in dense, many-flowered, globular clusters which are sometimes nearly an inch in diameter. Calyx mostly about equaling the corolla tube, lobes triangular-ovate, acute to acuminate, overlapping. Corolla campanulate-cylindrical, becoming somewhat urceolate, or globose about the developing capsule, slightly saccate between the stamen attachments toward the base, lobes triangular-ovate, acute to acuminate, smooth or slightly papillate, overlapping at the base, upright to spreading, or becoming reflexed in fruit, at least half the length of the tube. Stamens much shorter than the corolla lobes, oval-oblong, anthers on short, stout filaments. Scales oblong or somewhat oval, shorter than the tube, fringed with short processes, bridged at about a quarter of their height. Styles longer than, or about equaling, the subglobose-depressed ovary, subulate and tapering into the ovary. Capsule globose-depressed, circumscissile, with the withered corolla about it; seeds about 1.5 mm. long, somewhat rostrate, hilum short, oblong.

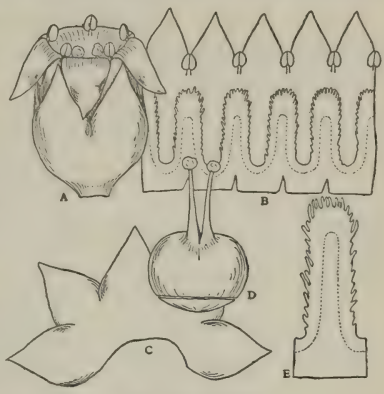

Fig. 78. C. foetida.

Ecuador and Peru.

Specimens examined.—ECUADOR: (*Seeman*); Quito (*Holmgren 442; Humboldt*, alt. 8–10000 ft., the type, a specimen in the herbarium of the Botanical Institute at Dahlem; *Spruce 5017; Jameson* in 1864; *Couthouy; E.W.D. & Mary M. Holway* in 1920); Cuenca (*E.W.D. & Mary M. Holway* in 1920); between Cuenca and Huigra, alt. 2700–3000 meters (*Hitchcock 21702*); Pichincha (*Holmgren* in 1920); Chillo valley, Santa Rosa, alt. 9600 ft. (*Anthony & Tate 205*).—PERU: (*Jussieu*, the type? of Jussieu's *C. corymbosa*, in the herbarium of the Museum d'Histoire Naturelle at Paris).

Cuscuta foetida pycnantha Yuncker

Cuscuta foetida pycnantha Yuncker, Am. Jour. Bot. **9**: 566. *pl. 5. f. 24f.* 1922.
Cuscuta pycnantha Bentham, Pl. Hartw. 226. 1839.

Flowers 7–9 mm. long. Calyx much shorter than the slenderly cylindrical tube. Perianth lobes narrower than in *C. foetida*, and with corolla lobes less than half the length of the tube.

Central and Northern Ecuador.

Specimens examined.—ECUADOR: Cuenca (*Hartweg 1238*, the type, in the Kew her-

barium); Prov. Pichincha, Malchinguí to Pomasqui, alt. 3000–3600 meters (*Hitchcock 20896*. This specimen is intermediate between this and *C. foetida*).

79. Cuscuta acutiloba Engelmann

Cuscuta acutiloba Engelmann, Trans. Acad. Sci. St. Louis **1**: 478. 1859.—Yuncker, Am. Jour. Bot. **9**: 567. *pl. 1. f. 5a–e.* 1922.

Stems medium to slender. Flowers 2.5–3 mm. long, on pedicels shorter than, or exceeding, the length of the flowers, in loose, cymose-umbellate clusters. Calyx as long as the corolla tube, lobes overlapping at the base and somewhat angled at the sinuses, triangular-ovate, acuminate or sometimes cuspidate. Corolla purplish-red, campanulate, becoming urceolate and globular about the ripening capsule, lobes lanceolate, acute, reflexed, overlapping at the base, mostly longer than the tube. Stamens much shorter than the lobes, the small, orbicular anthers about equal to the filaments. Scales oblong, narrow, reaching the stamens, sparingly fringed with short processes, bridged much below the middle. Styles subulate, shorter than, and tapering into, the globose ovary. Capsule depressed-globose, membranous, early circumscissile, with the withered corolla about it; seeds 1–1.5 mm. long, roundish or ovate, ordinarily four in each capsule, hilum short.

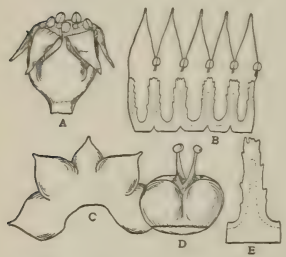

Fig. 79. C. acutiloba.

A very pretty and well marked species with its purplish flowers and long, recurved corolla lobes.

Peru and Bolivia.

Specimens examined.—Peru: Bridge of Obragilla (*Matthews*, the type, in the Kew herbarium). Dept. Arequipa, Arequipa, alt. 2800–2900 meters (*Pennell 13242*); Dept. Lima, Canta, alt. 3000–3200 meters, 'Corolla between dark perilla purple and black' (*Pennell 14595*).—Bolivia: Sorata (*Mandon 1481*).

Subsection Tinctoriae

Flowers about as broad as long, calyx about enclosing the corolla tube, mostly divided at least half way, lobes obtuse or sometimes acutish. Corolla lobes mostly about equaling the tube. Styles about the same thickness throughout or in some specimens slightly subulate.

KEY TO THE SPECIES

Calyx lobes not overlapping at the base (or but slightly so)
Flowers subsessile, or sessile, calyx commonly carinate

Flowers mostly 3–3.5 mm. long, styles commonly stoutish and not especially exserted.....80. *C. chinensis*
Flowers mostly about 2–2.5 mm. long, styles commonly slender and exserted....
81. *C. applanata*
Flowers on pedicels mostly equaling, or exceeding, the flowers, calyx not carinate...
82. *C. durangana*
Calyx lobes mostly overlapping at the base
Capsules globose-ovoid, thickened at the top.....83. *C. corniculata*
Capsules depressed-globose
Calyx lobes but slightly overlapping.....84. *C. incurvata*
Calyx lobes broadly overlapping
Scales reaching the stamens, mostly bridged at about the middle
Flowers mostly 4–5 mm. long, scales with medium to long fimbriae, often exserted.....85. *C. tinctoria*
Flowers 2–3 mm. long, scales with short fimbriae, not exserted...86. *C. aurea*
Scales shorter, bridged below the middle
Flowers about 5 mm. long, stigmas large and convoluted....87. *C. mexicana*
Flowers mostly less than 4 mm. long, stigmas moderate....88. *C. trichostyla*

80. **Cuscuta chinensis** Lamarck

Cuscuta chinensis Lamarck, Encyclopedie Methodique **2**: 229. 1786.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **1**: 279. 1841; also in DC. Prodr. **9**: 457. 1845.—Wight, Icon. Plant. Ind. Orient. **4**: *pl. 1373*. 1850.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 479. 1859.
Grammica aphylla Loureiro, Fl. Cochinch. **1**: 171. 1790.
Cuscuta carinata Brown, Prodr. Fl. Nov. Holland. et Ins. Van-Dieman **1**: 491. 1810.
Cuscuta capillaris Wallich Cat. no. 1321. Not Reichenbach nor Edgeworth.
Cuscuta americana Thunberg in herb. Not Linnaeus.
Cuscuta sulcata Roxburgh, Hortus Bengal. 12. 1814; Fl. Indica **1**: 467. 1820. Not Wallich.
?Pentake chinense Rafinesque, Fl. Tellur. **4**: 90. 1836.
Cuscuta chinensis minor Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 280. *pl. 3. f. 4.* 1841.
?Cuscuta chinensis trigyna Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 280. 1841.
Cuscuta hyalina Wight, Icones Pl. Ind. Orient. **4**: 14. *pl. 1372*. 1850; Illust. Ind. Bot. **2**: *pl. 168b. f. 12*. 1850.
Cuscuta fimbriata Bunge, ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 480. 1859.
Cuscuta chinensis carinata Engelmann, Trans. Acad. Sci. St. Louis **1**: 480. 1859.
?Cuscuta ndorensis Schweinfurth in Höhnel, Rudolph-See und Stephanie-See Append. 859. 1892.

Stems slender. Flowers 2–3.5 mm. long, short pedicellate, or nearly sessile, in dense glomerules. Calyx loose about the corolla, about reaching the corolla lobes, lobes triangular-ovate, thickened and fleshy towards the tops to form a carina, also more or less thickened below the sinuses, slightly overlapping, obtuse or acutish. Corolla slightly globular, becoming more so as the fruit de-

velops, lobes triangular-ovate, or oblong-ovate, spreading, acute or obtusish, more or less fleshy in a short carina towards the tip, or this mostly absent, shorter than the tube, or nearly equaling it, tips often inflexed. Stamens shorter than the lobes, filaments longer than the oval anthers. Scales reaching the stamens, more or less oblong, fringed with long, or medium length processes about the upper half, bridged low. Styles stoutish or slender, about equaling, or longer than, the depressed-globose ovary. Capsule thin, depressed-globose, circumscissile, enclosed by the corolla; seeds two to four in each capsule, 1.25 mm. long, hilum oblong, diagonal or perpendicular.

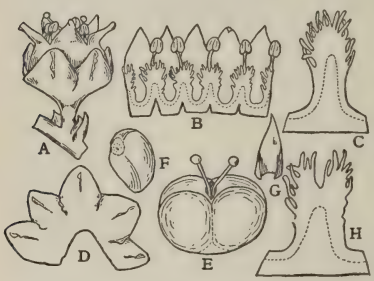

Fig. 80. A-G, C. chinensis; H, var. ciliaris.

From Abyssinia, Sokotra and Afghanistan eastward to Ceylon, Australia, and China, where it is most abundant. On a great variety of herbaceous hosts.

Specimens examined.—A specimen grown in the Jardin des Plantes, Paris from seeds supposedly from China (*Lamarck*, the type, in the herbarium of the Museum d'Histoire Naturelle at Paris); (*Wallich 1321; 1320*[2]).—AFGHANISTAN: (*Griffith 687*); ABYSSINIA (*Schweinfurth 94*); SOKOTRA (*Balfour in* 1880; *108; Schweinfurth 364; Mr. & Mrs. Bent* in 1897).—INDIA: (*hb. Wight 2006*). Tibet (*Abbé Monbeig*). Ceylon (*Thwaites 611; Thunberg; Lesenchault*); Colombo (*C.P. 611; Prain* in 1897; *Macrae 378*).—SIAM: Bangkok (*Kerr 4326; 11056; Lakshnakara 170*).—AUSTRALIA: (*Banks & Solander*); Queensland (*Etheridge*); New South Wales (*Brown*).—KOREA: base of Mt. Ouen-San (*Faurie 346*).—CHINA: Yarkand Plains (*Yarkand Exped.* in 1870); Chihli, Tientsin (*Clemens 1928; 1929; 6352*); Pekin (*Williams* in 1876; *Bushnell* in 1869); Yunnan (*Maire 3908*); Shansi, Tai-yuen-Fu (*Nyström* in 1902); Ho-nan, Kai-feug-Fu (*Schindler 201*); Shantung, Chi-fu (*Cowdry 778; Forbes* in 1872; *hb. Le Jolis 63*).

Cuscuta chinensis ciliaris Engelmann

Cuscuta chinensis ciliaris Engelmann, Trans. Acad. Sci. St. Louis **1**: 480. 1859.

Cuscuta ciliaris Hohenacker in Boissier, Diagn. Pl. Or. Nov. II. 3[3]: 129. 1856. Not Kotschy.

Cuscuta exigua Demidoff in herb. Paris.

Flowers 3–4 mm. long, filaments stout and shorter than the anthers; scales spatulate, truncated or bifid; styles stoutish. In other characters closely resembling *C. chinensis*.

Kurdistan, Afghanistan and Siberia.

Specimens examined.—KURDISTAN: Mossul (*Kotschy 431*, the type, a specimen in

the herbarium of the Missouri Botanical Garden; *Botta*).—AFGHANISTAN: (*Griffith 685*).—INDIA: (*hb. Wight propr. 2408*).—SIBERIA: Selenga River (*Demidoff*).

81. **Cuscuta applanata** Engelmann

Cuscuta applanata Engelmann, Trans. Acad. Sci. St. Louis **1**: 479. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 120. *f. 30, 68, 132*. 1921.

Cuscuta alata Brandegee, Univ. Calif. Publ. Bot. **3**: 388. 1909.

Stems medium to coarse. Flowers 2–3 mm. long, somewhat fleshy, or membranous, subsessile in dense cymose panicles. Calyx slightly shorter than, or equaling, the corolla tube, lobes broad, triangular-ovate, obtuse, frequently irregularly keeled in the median portion and below the sinuses down onto the short pedicels. Corolla campanulate, conforming in shape to the maturing capsule, lobes ovate-lanceolate to oblong, obtusish to acute, with slightly uneven edges, spreading, nearly as long as, or equaling, the tube. Scales longer than the tube, spatulate, fringed towards the top with medium length processes, bridged at from a quarter to a third of their height. Stamens shorter than the lobes, anthers ovate, slightly cordate, about equal to the filaments. Styles exserted, unequal, as long as, or mostly longer than, the globose ovary, stigmas capitate. Capsule depressed-globose, somewhat four-sided about the developing seeds, circumscissile, leaving the obcordate dissepiment in the persistent calyx, surrounded by the withered corolla; seeds about 1.4 mm. long, oval usually four in each capsule, hilum short, oblong, transverse to oblique.

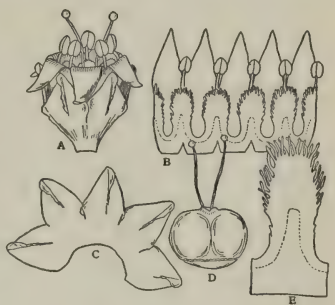

Fig. 81. C. applanata.

Southwestern United States and Mexico.

Type.—'In Arizona Territory south of the Gila River' (*Wright*, Mexican Boundary Survey, *1623–541*, in the herbarium of the Missouri Botanical Garden).

82. **Cuscuta durangana** Yuncker

Cuscuta durangana Yuncker, Bull. Torrey Club **49**: 109. *f. 3*. 1922.

Stems slender. Flowers membranous, about 2–3 mm. long, on pedicels mostly about as long as the flowers, in cymose panicles. Calyx about as long as the corolla, or scarcely reaching the sinuses, lobes ovate, obtuse, or, rarely, acutish, not overlapping. Corolla lobes ovate, obtuse, spreading, late becoming

reflexed, about as long as the campanulate tube. Stamens shorter than the lobes, the large, oval, more or less versatile anthers about equal to the stoutish filaments. Scales about reaching the stamens, oblong, obovate or spatulate, fringed about the upper half, bridged low. Styles slender and longer than the globose ovary. Capsule depressed-globose, circumscissile, carrying the withered corolla about it, apparently mostly two-seeded; seeds ovate, slightly rostrate, about 1.5 mm. long, hilum oblong, oblique.

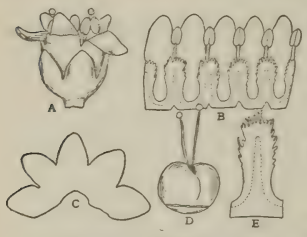

Fig. 82. C. durangana.

Specimens examined.—Mexico: Durango, alt. 1300 meters (*Endlich 268*, the type, in the herbarium of the Botanical Institute at Dahlem). Known only from the type locality.

83. **Cuscuta corniculata** Engelmann

Cuscuta corniculata Engelmann, Trans. Acad. Sci. St. Louis **1**: 504. 1859.—Yuncker, Am. Jour. Bot. **9**: 570. *pl. 2. f. 12a–e.* 1922.

Cuscuta corniculata sphaerocyma Engelmann, Trans. Acad. Sci. St. Louis **1**: 504. 1859. —Progel, in Martius, Fl. Bras. **7**: 382. *pl. 127. f. 4.* 1871.

Stems slender to medium. Flowers about 3 mm. long, subsessile in dense, lateral clusters. Calyx shorter than the corolla tube, lobes ovate, obtuse, slightly overlapping. Corolla campanulate, slightly fleshy, lobes ovate, acute, spreading, about as long as, or shorter than, the tube, tips inflexed and with the cells slightly papillate. Stamens slightly shorter than the lobes, the oval anthers shorter than the stout, subulate filaments. Scales reaching the stamens, abundantly fringed with medium-length processes, bridged at about the middle. Styles stout and but slightly subulate, shorter than, or nearly equaling, the globose ovary, which is thickened in the form of a ring about the widely gaping, intrastylar aperture. Capsule globose, exserted, irregularly circumscissile in a zone of very thin tissue towards the base, the withered corolla carried about the lower part of the capsule; seeds one to four in each capsule, 1.5–2 mm. long, ovate, hilum perpendicular.

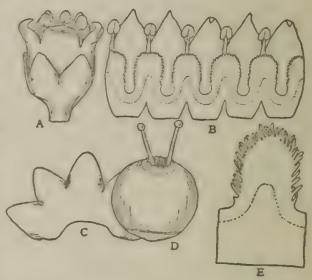

Fig. 83. C. corniculata.

This species resembles *C. indecora*, but differs from that species in having a circumscissile capsule. It differs also from *C. trichostyla* and *C. xanthochortos* in its short styles.

Brazil, Venezuela and Colombia.

Type.—'Brazil, Prov. Goyaz, on the campos near the Buixas' (*Weddell.* Not seen).

Specimens examined.—COLOMBIA: Villavicencio (*Dawe 270; Triana* in 1851–57; *Pennell 1453*).—VENEZUELA: on the Rio Meta (*Karsten*, taken as a co-type, a specimen in the herbarium of the Missouri Botanical Garden).

84. **Cuscuta incurvata** Progel

Cuscuta incurvata Progel in Martius, Fl. Bras. **7**: 379. *pl. 126. f. 4.* 1871.—Yuncker, Am. Jour. Bot. **9**: 571. *pl. 2. f. 7a–e.* 1922. Engelmann in Am. Jour. Sci. & Arts **45**: 73. 1843 proposed the name *incurvata* as a substitute for his *C. Coryli*, but he did not make the change in his later publications.

Cuscuta incurvata apaensis Chodat & Hassler, Bull. Herb. Boissier II. **7**: 280. 1907.

Stems slender to medium. Flowers about 2 mm. long, subsessile, in dense, cymose or umbellate clusters. Calyx mostly shorter than the corolla tube, lobes ovate, obtuse, scarcely imbricated. Corolla lobes nearly as long as the widely campanulate tube, reflexed, or upright, ovate, obtuse, or slightly acutish. Stamens shorter than the corolla lobes, oval anthers shorter than, or about equaling, the stout, subulate filaments. Scales reaching the stamens, fringed with short processes, bridged below the middle. Stout, sometimes slightly subulate, styles as long as, or longer than, the globose ovary. Capsule depressed-globose, membranous at the base, becoming late and irregularly circumscissile, carrying the withered corolla about it; seeds ovate-oblong, four in each capsule, about 1.5 mm. long, hilum oblique-perpendicular.

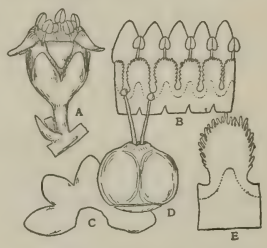

Fig. 84. C. incurvata.

This species differs from *C. trichostyla*, to which it bears some resemblance, in the fact that the calyx lobes do not broadly overlap and also by its longer scales.

Paraguay.

Type.—'Prope Lagoa Santa' (*Warming.* Not seen).

Specimens examined.—PARAGUAY: Sta. Maria (*Anisits 2395; 2555; 2854; Fiebrig* in 1909); between the rivers Apa and Aquidaban (*Fiebrig 4254; 5083*); upper course of the river Apa (*Hassler 8178*, the type of *C. incurvata apaensis*).

85. **Cuscuta tinctoria** Martius

Cuscuta tinctoria Martius, in Engelmann, Trans. Acad. Sci. St. Louis **1**: 480. 1859.—Progel, in Martius, Fl. Bras. **7**: 379. *pl. 126. f. 6.* 1871.

Cuscuta zacatlasculi Schaffner, in herb.

Cuscuta tinctoria typica Yuncker, Ill. Biol. Monogr. 6: 121. *f. 16a–e, 79.* 1921.

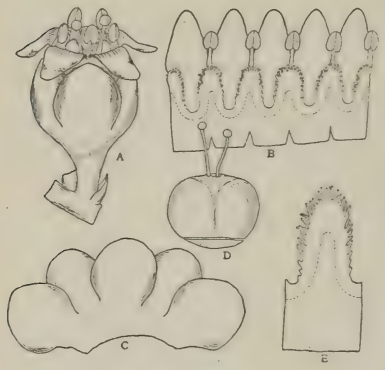

Fig. 85. C. tinctoria.

Stems medium to slender, or, in some specimens, rather coarse. Flowers smooth, 4–5 mm. long, sessile or on short pedicels, sometimes subtended by an ovate-orbicular, cupped bract, single, or in dense glomerules of many flowers. Calyx lobes unequal, orbicular, obtuse, overlapping, about as long as the corolla, sometimes keeled. Corolla campanulate, becoming urceolate in fruit, thinner towards the base, lobes ovate, or somewhat oblong, obtuse, overlapping, upright or mostly spreading. Scales reaching the filaments, bridged at about the middle. Stamens shorter than the lobes, filaments mostly about equal to the oval-oblong, somewhat versatile anthers. Styles mostly longer than the globose ovary, becoming exserted in fruit. Capsule depressed-globose, circumscissile; seeds about 1.5 mm. long, three or four usually in each capsule, angled, hilum oblong, linear, transverse, areola dark colored.

Throughout Mexico to Guatemala. On *Schinus molle, Quercus* and other woody hosts.

Specimens examined.—MEXICO: Jalisco (*Palmer 549; Rose & Painter 7473*); wooded hills near Guadalajara (*Pringle 4529*); San Luis Potosi (*Gregg 570; Schaffner 377; 781; Parry & Palmer 631; Palmer 87*); Queretaro, Queretaro (*Rose & Rose 11150*); Oaxaca (*Seler 1548; Karwinski* in 1827, the type, a specimen in the herbarium of the Missouri Botanical Garden); between Victoria and the Rio Blanco (*Karwinski* in 1842); Guanajuato (*Duges 4; 152*); Vera Cruz (*Seler 268*); Puebla (*Seler* in 1902); Coahuila, Monclova (*Palmer 918*).—GUATEMALA: (*Heyde 287*); Tatonicapam (*?Lehmann 1682*).

Cuscuta tinctoria Kellermaniana Yuncker

Cuscuta tinctoria Kellermaniana Yuncker, Ill. Biol. Monogr. 6: 122. *f. 16f–g.* 1921.

Scales oblong, quite sparingly fringed, bridged at about a third of their height; styles shorter than the globose-depressed ovary and capsule, not exserted.

Specimens examined.—GUATEMALA: Volcano Agua (*Kellerman 7567*, the type, in the herbarium of the New York Botanical Garden). Known only from the type locality.

86. **Cuscuta aurea** Liebmann

Cuscuta aurea Liebmann, Forhandl. Skand. Naturf. Christiana 193. 1847. Not Philippi.

Stems medium. Flowers 2–3 mm. long, sessile, or on short pedicels, in cymose clusters. Calyx somewhat fleshy, about enclosing the corolla tube, or slightly shorter, lobes ovate-orbicular, overlapping. Corolla lobes ovate, obtuse, spreading, mostly slightly shorter than the campanulate tube. Scales about reaching the stamens, or somewhat shorter, ovate-oblong, bridged at or below the middle, fringed with short processes. Stamens shorter than the corolla lobes, filaments mostly slightly shorter than the oval anthers. Styles shorter than the depressed-globose ovary. Matured fruit not seen, but undoubtedly it would be circumscissile.

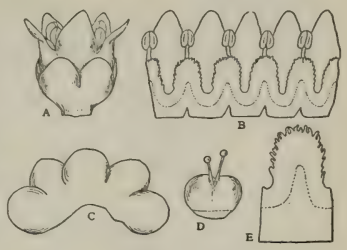

Fig. 86. C. aurea.

This species, which was apparently unknown to Engelmann, is very closely allied with *C. tinctoria*, and from the original description it is difficult to distinguish it from that species. Examination of Liebmann's original specimen, however, shows it to be distinct. It differs from *C. tinctoria* in its smaller flowers, shorter styles, and with scales with short processes and mostly just reaching the stamens, while in *C. tinctoria* the scales are often exserted and have longer processes.

Specimens examined.—Mexico: Chapulco (*Liebmann*, Dec. 1841, the type, in the herbarium of the University Botanical Museum at Copenhagen).

87. **Cuscuta mexicana** n. sp.

Caules medii usque crassi. Flores 4 mm. longi, subsessiles, albi et carnosi. Calyx brevior quam tubus corollae, lobis ovati-obtusis aut acutis. Interdum cum sub-apicali cuspali projecto. Filamenta robusta, paululum subulatae. Scalae breviores quam corollae tubus, oblongae. Styli aliquantum robusti, longiores quam ovarium globoso-depressum. Stigmata magna, convoluta. Capsula circumscissilis.

Stems medium to stout. Flowers about 5 mm. long, subsessile in paniculate-cymose clusters, white, thick and fleshy. Calyx somewhat shorter than the corolla tube, deeply divided, lobes oval-ovate, obtuse, broadly overlapping, thick and fleshy. Corolla lobes oval-ovate, upright to spreading, nearly as long as the campanulate tube, obtuse or acutish, not uncommonly with a short, sub-apical, cusp-like projection. Stamens shorter than the lobes, filaments stout, slightly subulate and longer than the oblong anthers. Scales shorter than

the corolla tube, oblong, bridged low, fringed about the upper part with short processes. Styles stoutish and somewhat subulate, longer than the globose-depressed ovary, becoming exserted, stigmas large, red?, convoluted. Capsule circumscissile, enveloped, by the withered corolla. Fully ripened fruit not seen.

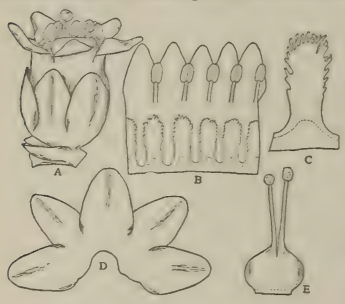

Fig. 87. C. mexicana.

This species differs from *C. trichostyla* in its large flowers, more loosely branching inflorescence, large convoluted stigmas, etc. It differs from *C. tinctoria* in its long exserted styles, oval-ovate, rather than orbicular calyx lobes, shorter scales, etc.

Specimens examined.—Mexico: Durango, Sianori (*Ortega 5363*, the type, in the U. S. National Herbarium as sheet 1,208,562). Known only from the type locality.

88. **Cuscuta trichostyla** Engelmann

Cuscuta trichostyla Engelmann, Trans. Acad. Sci. St. Louis **1**: 495. 1859.—Progel in Martius, Fl. Bras. **7**: 383. *pl. 126. f. 6.* 1871.
Cuscuta trichostyla typica Yuncker, Am. Jour. Bot. **9**: 572. *pl. 3. f. 15a–e.* 1922.

Stems slender. Flowers 2.5–4 mm. long, subsessile, in compact, globular clusters. Calyx not as long as the corolla tube, lobes ovate-orbicular, obtuse, broadly imbricated (not angled), somewhat carinate towards the top; bracts deltoid, acutish or obtuse, in some specimens closely investing the flower. Corolla lobes shorter than the campanulate-cylindrical tube, ovate, or somewhat oblong, obtuse, spreading or reflexed. Stamens shorter than the lobes, filaments stoutish and subulate, about equal to, or longer than, the ovate anthers. Scales oblong, not reaching the stamens, bridged below the middle, sparingly fringed with medium-length processes, well attached. Styles slender and not subulate, or, at the most, but slightly so, much longer than the depressed-globose ovary. Capsule depressed-globose, late and somewhat irregularly circumscissile, carrying the withered corolla about it, intrastylar aperture widely gaping. Mature seeds not seen.

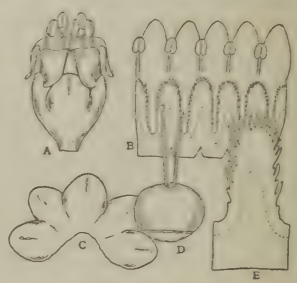

Fig. 88. C. trichostyla.

This species is closely allied with *C. xanthochortos*, but may be distinguished, however, by its more ovate than triangular calyx lobes which are broadly obtuse, and by its shorter corolla lobes.

Panama and northern Brazil.

Specimens examined.—Panama: (*Tweedie*, the type, in the Kew herbarium).—Brazil: Prov. Para, Santarem on *Hyptis* (*Spruce 854*).

Subsection Americanae

Flowers mostly elongated, longer than broad. Calyx deeply divided, or deep and cupulate. Flowers subsessile, or pedicellate, in cymose or corymbose clusters. Stigmas moderate, or large. Styles slender and mostly longer than the ovary. Perianth lobes obtuse.

KEY TO THE SPECIES

Calyx deeply divided, lobes as long as broad, broadly overlapping
- Corolla lobes ovate-oblong, longer than broad, at least half as long as the tube, ovary umbonate.....89. *C. floribunda*
- Corolla lobes shorter, more orbicular, ovary globose, not particularly umbonate
  - Calyx lobes orbicular, broadly overlapping, scales reaching the stamens..... 90. *C. orbiculata*
  - Calyx lobes ovate-orbicular, not so broadly overlapping, scales about reaching the stamens, or shorter.....91. *C. cozumeliensis*

Calyx more shallowly divided, lobes much shorter than the calyx tube
- Scales mostly bridged at, or above, the middle, the free portion usually much shorter than the united part, flowers 2–4 mm. long
  - Flowers 2–3 mm. long, capsules conic-globose, mostly 1-seeded..92. *C. americana*
  - Flowers 3–4 mm. long, capsules depressed-globose, often 2-seeded..... 93. *C. globulosa*
- Scales bridged below the middle, the free portion longer than the united (bridged) part
  - Scales narrowly oblong, moderately to sparingly fringed; calyx lobes scarcely, or but moderately overlapping; stigmas moderate
    - Corolla cylindrical, not especially saccate
      - Scales much shorter than the tube, filaments equaling or shorter than the anthers.....94. *C. corymbosa*
      - Scales nearly reaching the stamens, filaments longer than the anthers..... 91. *C. cozumeliensis*
    - Corolla saccate, more or less globose.....94. *C. corymbosa*
  - Scales more ovate, profusely fringed; calyx lobes broadly overlapping, thick and fleshy; stigmas large.....95. *C. macrocephala*

89. **Cuscuta floribunda** Humboldt, Bonpland & Kunth

Cuscuta floribunda Humboldt, Bonpland & Kunth, Nov. Gen. et Spec. Pl. **3**: 123 (96 in folio edition). 1818.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 283. 1841; also in DC. Prodr. **9**: 459. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 481. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 122. *f. 10*. 1921.

Flowers about 4 mm. long, short pedicellate, or sessile. Calyx lobes orbicu-

lar, obtuse, overlapping, shorter than the corolla tube. Corolla lobes ovate-oblong, obtuse, reflexed, between one-half and three-fourths as long as the cylindrical tube. Scales somewhat triangular, reaching the filaments, or shorter, rather sparingly fringed with medium length processes. Filaments subulate, anthers ovate. Capsule globose, with a thickened apex and ridge or corolla about the intrastylar aperture, styles stoutish and longer than the capsule which has the withered corolla at the top; seeds oval, hilum short, perpendicular.

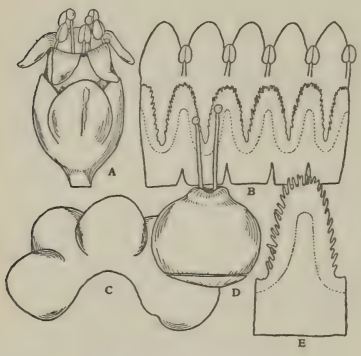

Fig. 89. C. floribunda.

Mexico.

Specimens examined.—Mexico: (*hb. Willdenow 3159*[2]); at the bridge of Istla, western Mexico, alt. 3000 feet (*Bonpland*, the type, in the herbarium of the Botanical Institute at Dahlem); Maltrata (*Kerber 248*).

90. **Cuscuta orbiculata** Yuncker

Cuscuta orbiculata Yuncker, Am. Jour. Bot. 9: 572. *pl. 4. f. 19a–e.* 1922.

Stems thick. Flowers 4–5mm. long, subsessile in racemose-spicate clusters. Calyx deep, nearly, or about, as long as the corolla tube, lobes orbicular, thick and fleshy, overlapping, edges finely irregular. Corolla cylindrical, soon becoming urceolate about the developing capsule, lobes short, ovate-orbicular, obtuse, overlapping, spreading to reflexed. Stamens shorter than the lobes, filaments stout, equal to, or shorter than, the ovate anthers. Scales oblong, or deltoid, about reaching the stamens, prominent, heavily fringed, bridged at, or below, the middle. Styles slender, equal to, or longer than, the globose ovary; stigmas rather large. Capsule globose, circumscissile, the withered corolla enveloping it; only one seed found in each of the few capsules opened, orbicular, about 1.5 mm. long, hilum perpendicular.

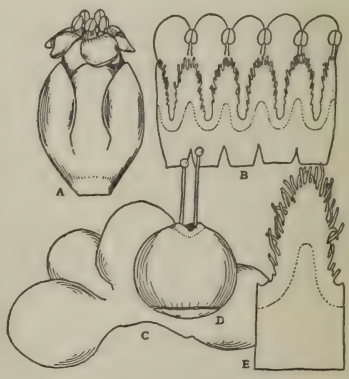

Fig. 90. C. orbiculata.

This species resembles *C. globiflora*, but differs in its slender styles, and the form of the stigmas. It differs from *C. americana* in the shape of the calyx, scales and capsules.

Goyaz and Fernando de Noronha, Brazil.

Specimens examined.—BRAZIL: Cachoeira, Goyaz (*Glaziou 21809*, the type, in the Kew herbarium); Isl. Fernando de Noronha (*Ridley, Lea & Ramage* in 1887; *Moseley* in 1873).

91. Cuscuta cozumeliensis Yuncker

Cuscuta cozumeliensis Yuncker, Bull. Torrey Club **49**: 108. *f. 2.* 1922.

Stems rather coarse. Flowers 4–5 mm. long, on pedicels about as long as, or shorter than, the flowers, in cymose clusters. Calyx shorter than the corolla tube, lobes ovate-orbicular, overlapping, somewhat fleshy towards the base, margins very uneven. Corolla lobes erect or spreading, overlapping, obtuse, or rarely slightly acutish, margins uneven, about half as long as the cylindrical tube. Stamens shorter than the lobes, filaments stoutish, about equal to, or slightly longer than, the oval anthers. Scales about reaching the stamens, or shorter, oblong, moderately fringed with medium length processes, bridged at about a quarter of their height. Styles slender, much longer than the depressed-globose ovary. Capsule circumscissile, carrying the withered corolla about it. Matured seeds not seen.

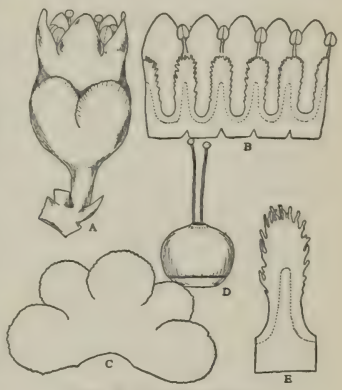

Fig. 91. C. cozumeliensis.

This species resembles *C. macrocephala* from which it differs in having longer filaments, longer scale processes and smaller stigmas. It is also close to *C. corymbosa* but differs in not having the corolla bulging between the filament attachments as it does in that species and with broader scales and more orbicular and overlapping calyx lobes.

Yucatan peninsula.

Specimens examined.—YUCATAN: Cozumel Island (*Gaumer 90*, the type, in the Gray herbarium); Titas (*Seler 3965*).

92. Cuscuta americana Linnaeus

Cuscuta americana Linnaeus, Spec. Pl. 124. 1753.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 282. *pl. 4. f. 4.* 1841; also in DC. Prodr. **9**: 459. 1845.—Engelmann, Trans.

Acad. Sci. St. Louis **1**: 482. 1859.—Progel in Martius, Fl. Bras. **7**: 376. *pl. 126. f. 1.* 1871.—Yuncker, Ill. Biol. Monogr. **6**: 122. 1921; Am. Jour. Bot. **9**: 573. 1922.

Cuscuta surinamensis Schilling, Comm. Lepra. 200, *pl. 2.* 1778.

Cuscuta graveolens Humboldt, Bonpland & Kunth, Nov. Gen. Sp. Pl. **3**: 122 (96 in folio edition). 1818.

Nemepis americana Rafinesque, Fl. Tellur. **4**: 91. 1836.

?Nemepis prolifera Rafinesque, Fl. Tellur. **4**: 91. 1836.

?Dastylepis Brownei Rafinesque, Fl. Tellur. **4**: 125. 1836.

?Eronema Robinsoni Rafinesque, Fl. Tellur. **4**: 125. 1836.

Cuscuta spectabilis Choisy, Mém. Soc. Phys. et Hist. Nat. Genève **9**: 283, *pl. 5, f. 1.* 1841; also in DC. Prodr. **9**: 459. 1845.

Cuscuta leiolepis Miquel, Linnaea **18**: 247. 1844.

Cuscuta congesta Bentham, Bot. Sulph. 138. 1845.

Cuscuta campanulata Nuttall mss. in Hb. Ac. Phil., ex Engelmann, Trans. Sci. St. Louis **1**: 482. 1859. Not Stokes.

Cuscuta americana congesta Progel, in Martius, Fl. Bras. **7**: 376. 1871.—Yuncker, Ill. Biol. Monogr. **6**: 123, *f. 22, 109, 138.* 1921.

Cuscuta americana spectabilis Progel in Martius, Fl. Bras. **7**: 377. 1871.

Cuscuta americana parviflora in hb. Urban in herb. Berol.

Stems medium. Flowers 2–3 mm. long, subsessile and closely compacted in many-flowered clusters, usually dark-brown in herbarium specimens. Calyx tubular, as long as, or somewhat shorter than the corolla tube, lobes broadly ovate, overlapping, obtuse, mostly much shorter than broad. Corolla cylindrical, included in the calyx, with usually only the short, ovate, obtuse, upright to slightly spreading lobes exserted, but becoming exserted on the capsule. Scales triangular, or sometimes somewhat oblong, fringed with short processes, shorter than the tube, or sometimes reaching the base of the stamens, ordinarily bridged above the middle. Stamens subsessile, on filaments shorter than the anthers, included, anthers oval and frequently with the connective apiculate. Styles longer than the globose ovary, about reaching the corolla lobes or somewhat exserted, slender, stigmas capitate. Capsule globose-ovoid or ovoid, circumscissile, capped by the withered corolla; seeds about 1.5 mm. long, ordinarily but one in a capsule, ovoid, with an indentation running lengthwise in many specimens, hilum small, oval, oblique or reduced to a rounded spot.

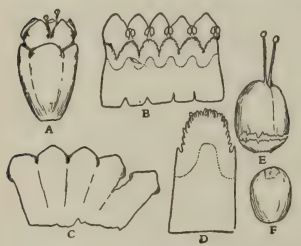

Fig. 92. C. americana.

Progel considered Choisy's *C. spectabilis*, which Choisy established on two collections from South America, to be a larger form of *C. americana*

and which he designated as variety *spectabilis* of *C. americana*. Examination of the type specimens of *C. spectabilis* in the De Candollean herbarium shows, however, that they are the same as *C. americana*. A closely related form with larger flowers, often confused with *C. americana* in herbaria, is to be recognized, however. This larger form, which is not the same as Choisy's *C. spectabilis*, appears to be specifically distinct and is the same as Bentham's *C. globulosa* to which it is now referred.

C. americana is the common species of dodder throughout the West Indies. It is less common in Mexico. In South America it extends southward to northern Argentina. One specimen has been seen from southern Florida. On a great variety of hosts, mostly woody.

Specimens examined.—A specimen in the Linnaean herbarium, labelled *C. americana* by Linnaeus, taken to represent the type.

WEST INDIES:—ST. MARTIN (*Boldingh 2349B*)—ST. EUSTATIUS (*Boldingh 587B*). —SABA (*Boldingh 1413B*).—JAMAICA: Kingston (*Maxon & Killip 1389*); Santo Domingo (*Türckheim 3748*, labelled *C. americana parviflora* in hb. Urban).—ST. THOMAS: (*Eggers 144; Britton, Britton & Kemp 2*).—ANGUILLA: (*Boldingh 3480B*).—BAHAMAS: Eleuthera, Governor's Harbor (*Britton & Millspaugh 5519*); Grand Turk Isl. (*Millspaugh & Millspaugh 9029*); Cat Island: (*Britton & Millspaugh 5925*); Port Howe (*Britton & Millspaugh 5963*); Cave Cay, Exuma Chain (*Britton & Millspaugh 2811*); Frozen Cay, Berry Islands (*Britton & Millspaugh 2208*).—GUADELOUPE: Basse-Terre (*Père Duss 2468*).—MARTINIQUE (*Père Duss 1878*).—BONAIRE: (*Boldingh 7381*).—CUBA (*Fre. Leon 12400; Linden 1994* in part).—GRENADA: (*Miller 107*).—HAITI: vic. St. Michel de l'Atalaye, Dept. du Nord, alt. 350 meters (*Leonard 7076*); vic. Fond Parisien, Etang Saumatre (*Leonard 4135*).—CURAÇAO (*Killip & Smith 21045; Boldingh 4759*).

MEXICO:—Guerrero (*Langlassé 127*); Acapulco (*Bentham*, the type of *C. congesta*, in the Kew herbarium); Sinaloa, Mazatlan (*Gregg* in 1849); Yucatan (*Gaumer & Sons 23602; Linden* in 1840); Campeche (*Chrismar*); Vera Cruz (*Purpus 8176*).

SOUTH AMERICA:—VENEZUELA: (*Karsten*); Cumana (*Humboldt*, the type of *C. graveolens*, in the herbarium of the Botanical Institute at Dahlem); Prope Coloniam Tovar (*Fendler 2069*).—SURINAM: (*Miquel*, type of *C. leiolepis; Hostmann 464; Focke 383*).—BRAZIL: (*Weddell 2298; Gardner 1775*); Bahia (*Blanchet 85*, the type of *C. spectabilis*, in the De Candolle herbarium; *736; Salzman 351*); Fernando do Noronha (*Ridley, Lea & Ramage 73*); Minas Geraes (*Claussen 306*); Goyaz (*Weddell 2208*); Matto Grosso, Cuyaba (*Malme 1898*).—COLOMBIA: Santa Marta (*Smith 2549; 1590*); Dept. Cundinamarca, Girardot (*Rusby & Pennell 93*).—ECUADOR: Bodegas (*Sodiro 113/9*).—ARGENTINA: Prov. Jujuy (*Fries 229*).

UNITED STATES:—Southern Florida (*Bailey & Bailey 6457*).

93. **Cuscuta globulosa** Bentham

Cuscuta globulosa Bentham, Bot. Sulph. 138. 1845. Not Boissier & Reutter.
Cuscuta americana spectabilis Yuncker, Ill. Biol. Monogr. **6**: 124. 1921, in part.

Stems medium to coarse. Flowers 3–4 mm. long, subsessile in cymose or racemose, compact, or somewhat loose, clusters, mostly yellowish in herbarium

specimens, and somewhat membranous. Calyx campanulate-cylindrical, as long as, or somewhat shorter than the corolla tube, divided from a third to a half its length, lobes broadly ovate-orbicular, overlapping, obtuse. Corolla cylindrical, lobes short, ovate, obtuse, upright to slightly spreading. Scales fringed with moderate processes, bridged mostly at or below the middle, shorter than the tube, or about reaching the stamens. Stamens subsessile, anthers oval. Styles much longer than the globose ovary, slender, exserted, stigmas capitate. Capsule depressed-globose, circumscissile, capped by the withered corolla; seeds commonly two in each capsule, ovoid, slightly compressed, with an indentation running lengthwise, hilum small, oval oblique.

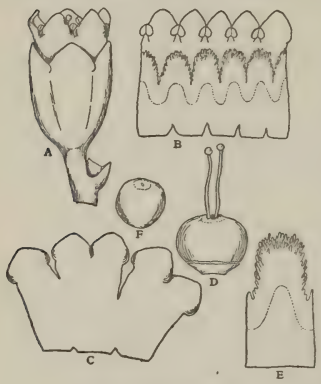

Fig. 93. C. globulosa.

This species is closely allied with *C. americana* and has been united with it by most authors. It would seem, however, to be sufficiently distinct to warrant segregation as an independent species. It differs in its larger size, lighter colored flowers, less dense inflorescence, more rounded calyx lobes, depressed-globose capsules, more exserted styles and more deeply fimbriated scales with lower bridges.

Common throughout the West Indies and sparingly in Mexico.

Specimens examined.—Mexico: Acapulco (*Bentham*, the type, a fragment in the herbarium of the Missouri Botanical Garden); Puebla (*Nicolas* in 1908; in 1909); Yucatan (*Gaumer 705*, an elongated form).

West Indies.—Cuba: (*Linden 1994*, in part; *Bro. Hioram 2279; Wright 1659*, in part; *Fr. Leon 12033*); Rio Guaso (*Eggers 4534*).—Santo Domingo: (*Poiteau* in 1802; *Fuertes 194; Türckheim 2974*).—Porto Rico: (*Bertero; Heller 470; Sintenis 2037*); Mayaguez (*Sintenis 855; 855b*); 7 miles west of Ponce (*Heller 6169*); Coamo Springs (*Britton, Britton & Brown 5820; 5842; 6365; Sintenis 3239*).—St. Thomas: (*Wydler 10; Eggers* in 1882).—St. Vincent: (*Smith & Smith 390*).—St. Eustache: (*Suringar in* 1885).—St. Croix: Ann's Hope (*Thompson 1041*).—St. Christopher: (*Bailey & Bailey 161*).—Trinidad: St. Augustine (*Britton, Hazen & Freeman 947*); Tortola (*Fishlock 489*).—Tobago: (*Broadway 2464*).—Haiti: vic. Gros Morne, Dept. l'Artibonite, alt. 235 meters (*Leonard 9798*); vic. Anse Galette, Gonaive Isl. (*Leonard 3073; 3074*).—Bahamas: north end Anguilla Isles, Salt Key Bank (*Wilson 7983*).

94. Cuscuta corymbosa Ruiz & Pavon

Cuscuta corymbosa Ruiz & Pavon, Fl. Peruv. **1**: 69. *pl. 105. f. b.* 1798.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 483. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 124. 1921.

Not Choisy nor Jussieu.

?Kadula corymbosa Rafinesque, Fl. Tellur **4**: 90. 1836.

Cuscuta corymbosa microlepis Engelmann, Trans. Acad. Sci. St. Louis **1**: 484. 1859.—Yuncker, Am. Jour. Bot. **9**: 573. *pl. 4, f. 20a-e.* 1922.

Stems medium. Flowers about 4 mm. long, on pedicels about equaling the flowers, forming more or less loose corymbose-paniculate inflorescences. Calyx membranous, about reaching the middle of the corolla tube, lobes short, broad, obtuse, slightly overlapping. Corolla lobes about a fourth to a half as long as the cylindrical tube, ovate-oblong, obtuse, upright to spreading. Scales thin, narrow, about reaching the middle of the tube, dentate, or with a few scattered processes, bridged below the middle. Stamens about half as long as the lobes, ovate-cordate anthers about equal to the filaments. Styles longer than the small, globose, or ovoid ovary, becoming exserted. Capsule small, globose, circumscissile, capped and surrounded by the withered corolla; seeds about 1.5 mm. long, one to four in a capsule, oblique, hilum short.

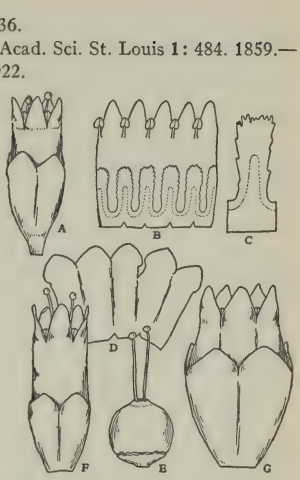

Fig. 94. A-E, C. corymbosa; F, var. stylosa; G, var. grandiflora.

Ruiz & Pavon's *C. corymbosa* is known only from their collections from Peru. It is distinguished from *C. americana* by the proportion of its perianth lobes, form of scales, etc.

Specimens examined.—Peru: (*hb. Ruiz*, taken to represent the type, a specimen in the herbarium of the Missouri Botanical Garden; *hb. Pavon*).

Cuscuta corymbosa stylosa Engelmann

Cuscuta corymbosa stylosa Engelmann, Trans. Acad. Sci. St. Louis **1**: 484. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 125. *f. 24f, 110.* 1921.

Cuscuta stylosa Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 283, *pl. 5. f. 2.* 1841; also in DC. Prodr. **9**: 459. 1845.

Flowers about 4–6 mm. long. Corolla cylindrical and slightly, or not at all, bulging in the basal portion. Calyx not ordinarily reaching beyond the middle of the tube. Filaments sometimes as long as the anthers. Ovary globose-ovoid to conic.

Mexico. On *Vaseyanthus, Hofmeisteria, Boehmeria,* etc.

Specimens examined.—Mexico: (*Berlandier 822*, the type, in the De Candolle herbarium; *Ghiesbrecht 186*); Toluca (*Andrieux 73; 214*); Churubusco (*Orcutt 4288*); Vallé de Cordova (*Bourgeau 7995*); San Luis Potosi (*Virler 1925*); Federal District

(*Pringle 6574*); Vera Cruz, Orizaba (*Bourgeau 3353; Mueller 1260*); Zacuapan (*Purpus 5745; 7564; 7775*); Vera Cruz (*Parry & Palmer* in 1877); Oaxaca (*Smith 829*); Hidalgo, Zimapan (*Galeotti 1412*); Chiapas, San Christobal (*Salazar* in 1913); Comitan (*Linden 291*); Puebla (*Nelson 2014*); Lower California, Isla Partida (*Johnston 3222*).

Cuscuta corymbosa grandiflora Engelmann

Cuscuta corymbosa grandiflora Engelmann, Trans. Acad. Sci. St. Louis **1**: 483. 1859.—Progel in Martius, Fl. Bras. **7**: 377. *pl. 126. f. 2.* 1871.—Yuncker, Ill. Biol. Monogr. **6**: 125. *f. 24a–e, 104.* 1921.

Cuscuta popayanensis Humboldt, Bonpland & Kunth, Nov. Gen. Sp. Pl. **3**: 123 (97 in folio ed.). 1818. Not Poeppig.

Cuscuta cymosa Willdenow in Roemer & Schultes, Syst. **6**: 205. 1820.

Cuscuta inclusa Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 275. *pl. 2. f. 2.* 1841; also in DC. Prodr. **9**: 455. 1845.

Cuscuta patens Bentham, Bot. Voy. Sulph. 35. 1844.

Cuscuta laxiflora Bentham, Bot. Voy. Sulph. 138. 1845.

?Cuscuta corymbosa patens Progel in Martius, Fl. Bras. **7**: 377. 1871.

Flowers large (3–7 mm. long). Calyx ordinarily more than half as long as the corolla tube. Corolla more or less globular, furrowed along the stamen attachments, particularly in the lower half, and bulging between the furrows. Anthers on short filaments, or sessile. Scales set out on more or less of a ridge away from the corolla in many specimens.

From central Mexico, through Guatemala and Costa Rica to Colombia, Venezuela and Ecuador. Not seen from the West Indies. On *Tephrosia, Ficus, Solanum,* Compositae, etc.

Specimens examined.—Mexico: (*Schumann 932; Hahn 18*); Mt. Guadalupe (*Bourgeau 971*); Toluca (*Berlandier 1103*, the type of *C. inclusa*, in the De Candolle herbarium); Chiapas, Comitan (*Linden*); Jalisco (*Pringle 4331*); Guerrero, Acapulco (*Bentham*, the type of *C. laxiflora*, in the Kew herbarium); Tamaulipas, Victoria (*Palmer 56*); Federal District, Cerro de Guadalupe, alt. 7500 ft. (*Pringle 11306*); Tepic, Acaponeta (*Rose, Standley & Russell 14329*); Lower California, Magdalena Bay (*Bentham*, the type of *C. patens*, in the Kew herbarium, this has shorter flowers and styles, but otherwise is the same thing: *Brandegee 9*).

Central America:— Guatemala: San Felipe (*Kellerman 5576*); Aceituna (*Smith 1912*); Mazatenango (*Bernoulli 59; Kellerman 4591*); Vol. Fuego (*Salvin* in 1873); Dept. Alta Vera Paz, Coban (*Türckheim 855; II 1547*); Retalhuleu (*Bernoulli & Cairo 1916*); Escuintla (*Tonduz 71*); Dept. Sololá (*Kellerman 5916A*); Santa Barbara (*Shannon 75*).—Costa Rica: (*Tonduz 7359; 11750; Pittier & Tonduz 9625; ?Pittier 10514*, a very narrow form); Prov. Cartago (*Standley 35512; 33375*); San José (*Standley 33271*). —El Salvador: vic. Ahuachapán, alt. 800–1000 meters (*Standley 19935*).

South America:—Colombia: Popayan (*Humboldt*, the type, a specimen in the herbarium of the Missouri Botanical Garden, also the type of *C. cymosa; Hartweg 1237*); Dept. Santander, Rio Suratá valley between El Jaboncillo and Suratá, alt. 1500–1800 meters (*Killip & Smith 16417*); Dept. Norte de Santander, Culagá Valley, near Tapatá (north of Toledo), alt. 1500–2100 meters (*Killip & Smith 20180*).—Venezuela:

near Coloniam Tovar (*Fendler 946*); Caracas (*Birschel; Gollmer*); Cumana (*Moritz 489*).—Ecuador: Cotacachi (*Holmgren 924*); between Guaranda and Bodegas (*Remy*).

95. **Cuscuta macrocephala** Schaffner

Cuscuta macrocephala Schaffner, in Yuncker, Ill. Biol. Monogr. 6: 126. *f. 19, 108.* 1921.

Stems coarse. Flowers glabrous, 5–6 mm. long, on pedicels as long as, or shorter than the flowers, in scattered, cymose clusters. Calyx deep, texture thick and rather fleshy, nearly covering, in most specimens, the cylindrical corolla, somewhat angled below the sinuses, lobes short, broadly ovate, lobed at the base, overlapping. Corolla lobes short, broadly ovate or somewhat oblong, obtuse, overlapping, lobed at the base, upright to slightly spreading. Scales deltoid, or mostly oblong, and mostly shorter than the corolla tube, shallowly fringed, bridged at, or somewhat below, the middle. Stamens sessile or on short filaments, anthers oval. Styles much longer than the globose or slightly conic ovary, stigmas broad (in some flowers 1 mm.), globular or slightly conic and mostly convoluted. Capsule circumscissile, globose, the withered corolla carried at the top; seeds about 2 mm. long, one to four in each capsule, oval, angled, hilum a narrow transverse line.

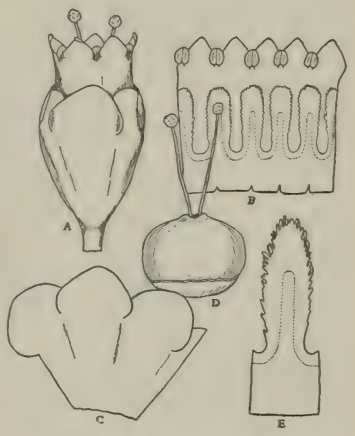

Fig. 95. C. macrocephala.

This species differs from *C. corymbosa* in its mostly thicker and fleshier calyx with broader and difinitely overlapping lobes, more prominent scales and larger stigmas.

Mexico.

Specimens examined.—Mexico: Lower California. San José del Cabo (*Brandegee* in 1897); Todos Santos (*Brandegee* in 1890); San Bartolomé (*Brandegee 409*); LaPaz (*Palmer 141*); Sinaloa, Culiacan (*Brandegee* in 1904; *Schaffner*, the type, in the herbarium of the New York Botanical Garden); Tamaulipas, Victoria (*Palmer 52*); Guerrero, Acapulco (*Hooker* in 1845; *Hancock 45*).

Subsection Prismaticae

Flowers slender, elongated; lobes of the perianth acute. Scales small, short, styles slender and much longer than the globose ovary.

96. **Cuscuta prismatica** Pavon

Cuscuta prismatica Pavon mss., ex Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 278, *pl. 3, f. 2.* 1841. also in DC., Prodr. **9**: 457. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 485. 1859.—Yuncker, Am. Jour. Bot. **9**: 574. *pl. 3. f. 14a–e.* 1922.

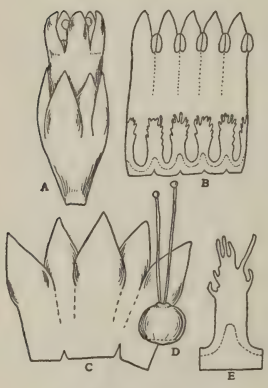

Fig. 96. C. prismatica.

Flowers about 6 mm. long, subsessile, in dense clusters, bracts triangular-lanceolate, acute. Calyx deep, reaching to the middle of the corolla tube, or above, slightly angled, reddish, papillate, divided to the middle or lower, lobes unequal, ovate, acute, overlapping. Corolla granulate, lobes about one-fourth as long as the cylindrical tube, upright to spreading, oblong, acutish and sometimes cuspidate. Oval anthers sessile. Scales short, not reaching to the middle of the tube, sparingly fringed toward the apex with few processes, bridged below the middle (not lacking, as figured by Choisy, and as stated by Engelmann). Styles slender, much longer than the globose ovary, stigmas large, globose. Only a fragmentary capsule has been seen, but that was evidently circumscissile. Matured seeds not seen.

Vicinity of Guayaquil, Ecuador.

Specimens examined.—Ecuador: Guayaquil (*Pavon,* the type, a specimen in the herbarium of the Missouri Botanical Garden; *Remy* in 1856; *Hitchcock 20141*).

Subsection Odontolepisae

Flowers mostly red or whitish, sessile or, mostly, subsessile. Perianth lobes acute to acuminate. Corolla lobes not exceeding the length of the tube. Scales prominently fimbriated, or dentated. Styles mostly longer than the ovary.

KEY TO THE SPECIES

Styles mostly much longer than the ovary (about equaling it in some specimens of *C. partita*), flowers mostly more than 2.5 mm. long.
Corolla cylindrical or campanulate (swollen towards the base in *C. Cockerellii*), not saccate; calyx lobes mostly overlapping
Corolla lobes about as broad as long (not slenderly lanceolate or acuminate)
Calyx lobes broadly ovate, overlapping
Flowers cylindrical, yellowish or reddish, anthers subsessile. . 97. *C. Purpusii*
Flowers mostly campanulate, white, more or less granulate-papillate, filaments equaling the anthers
Scales fimbriated, perianth lobes sharply acuminate, or cuspidate . . . . . 98. *C. costaricensis*

Scales dentate at the top only, perianth lobes not sharply acuminated or cuspidate.....99. *C. odontolepis*
Calyx lobes triangular, but slightly overlapping, scales dentate, flowers reddish. 100. *C. dentatasquamata*
Corolla lobes much longer than broad, lanceolate
Calyx lobes mostly about as broad as long, not long pointed
Anthers on filaments, calyx lobes not overlapping.....101. *C. Hitchcockii*
Anthers sessile, calyx lobes overlapping.....102. *C. Cockerellii*
Calyx lobes longer than broad, long taper pointed
Scales about reaching the filaments, flowers not over 4 mm. long..... 103. *C. Choisiana*
Scales about reaching the middle of the tube, flowers larger..104. *C. Ortegana*
Corolla more or less globose, saccate between the filament attachments, calyx lobes not overlapping, flowers red.....105. *C. partita*
Styles as long as, or mostly shorter, than the ovary, flowers small....106. *C. potosina*

97. **Cuscuta Purpusii** Yuncker

Cuscuta Purpusii Yuncker, Ill. Biol. Monogr. **6**: 127. *f. 23, 90.* 1921.

Stems slender to medium. Flowers smooth, about 4 mm. long, on pedicels shorter, or longer, than the flowers, in loose, few-flowered, cymose panicles. Calyx nearly as long as, or longer than, the corolla, lobes ovate-triangular, or somewhat lanceolate, acute, slightly lobed at the base, overlapping, tips may be somewhat divergent. Corolla lobes spreading to reflexed, ovate-lanceolate acutish, somewhat overlapping, shorter than the cylindrical tube. Scales nearly reaching the filaments, spatulate, fringed, bridged at from a quarter to a third of their height. Anthers elliptical, or oblong, sessile or subsessile on very short filaments. Styles much longer than the globose ovary. Capsule probably circumscissile. Matured fruit not seen.

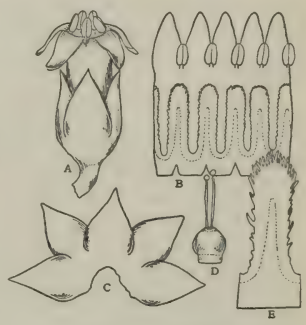

Fig. 97. C. Purpusii.

Central Mexico.

Specimens examined.—Mexico: San Luis Potosi (*Purpus 4972; 5444*, the type, in the University of California herbarium as sheet 157, 411).

98. **Cuscuta costaricensis** n. sp.

Cuscuta odontolepis fimbriata Yuncker, Ill. Biol. Monogr. **6**: 129. *f. 7e.* 1921.

Caules tenues. Flores albi, ±papillati, circ. 4 mm. longi, subsessiles. Calycis lobi late ovati, acuti aut acuminati. Corollae lobi late ovati aut fere orbiculares, acuti aut acuminati, breviores quam tubus campanulatus. Scalae

oblongae. Styli tenues et multo longiores quam ovarium globosum. Capsula depresso-globosa, circumscissilis.

Stems slender. Flowers about 4 mm. long, white, mostly more or less papillate, subsessile, in compact, glomerulate clusters. Calyx loose about, and enclosing, the corolla tube, lobes broadly ovate, acute, or mostly acuminate (a projecting cusp is common in many flowers at or near the tip of the lobes), slightly overlapping. Corolla lobes broadly ovate, or nearly orbicular, upright or spreading, shorter than the campanulate tube, acute or acuminate, or mostly with a sharp cusp at the apex, or dorsally sub-apical. Stamens shorter than the lobes, filaments mostly equaling or exceeding the oval anthers in length. Scales oblong, reaching the stamens, fimbriated at the top and along the sides with moderate processes, bridged one-third to one-half of their height. Styles slender and much longer than the globose ovary. Capsule depressed-globose, circumscissile, intrastylar opening large; seeds about 1.75 mm. long, ovate, hilum short, oblique.

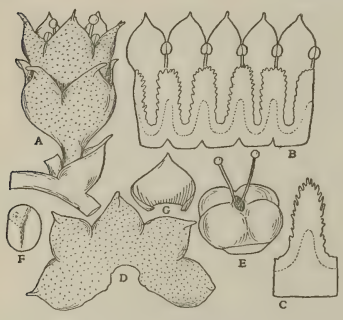

Fig. 98. C. costaricensis.

This species resembles *C. odontolepis* in many respects, but differs in the shape and proportion of the cuspidate corolla lobes and also in its oval anthers and fimbriated scales.

Costa Rica and central Mexico.

Specimens examined.—Costa Rica: (*Warscewicz* in 1848); Curidabad (*Hoffmann 463*); Ochomogo, alt. 530 meters (*Tonduz 10873*); between San Jose and San Francisco de Guadeloup, alt. 1170 meters (*Pittier 9034; Tonduz 17937*).—Mexico: Durango, Santiago Papasquiaro (*Palmer 412*, the type, in the U. S. National Herbarium as sheet 304, 596); Guanajuato, Guanajuato (*Duges* in 1880).

99. **Cuscuta odontolepis** Engelmann

Cuscuta odontolepis Engelmann, Trans. Acad. Sci. St. Louis 1: 486. 1859.
Cuscuta sonoriensis Engelmann, in herb. Paris.
Cuscuta odontolepis typica Yuncker, Ill. Biol. Monogr. 6: 129. *f. 7a–d, 116, 153.* 1921.

Stems slender. Flowers whitish, 3–5 mm. long, membranous and comparatively thin, on pedicels shorter than the flowers, in dense, cymose-paniculate clusters, usually with a broadly ovate, acute bract subtending one or more flowers. Calyx shorter than, or mostly equaling or exceeding the corolla tube, papillose-verrucose, lobes broad, ovate-deltoid, acute, overlapping. Corolla lobes three-fourths to as long as the cylindrical or campanulate tube, ovate

acute, longer than broad, upright to spreading, or becoming reflexed. Scales large, oblong, or somewhat spatulate, dentate about the upper part only, bridged low, about reaching the filaments. Stamens shorter than the lobes, anthers oval, about equal to the filaments. Styles slender, longer than the globose, somewhat umbonate ovary, becoming exserted and sometimes slightly subulate in fruit, stigmas capitate. Capsule globose, thickened at the top, readily circumscissile, surrounded and capped by the withered corolla; seeds about 1.2 mm. long, generally four in each capsule, angled, hilum linear, oblique.

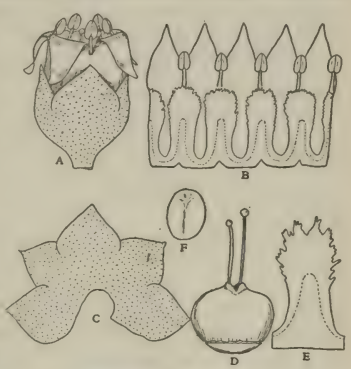

Fig. 99. C. odontolepis.

Southern Arizona and northern Sonora.

Specimens examined.—ARIZONA: on *Amaranthus* (*Wright 1624* (*529*)), the type a specimen in the herbarium of the Missouri Botanical Garden; Santa Rita Mts. south of Tucson (*Engelmann* in 1880); Santa Rita Forest Reserve (*Griffiths & Thornber 21*).—MEXICO: Sonora, Fronteras (*Hartman 52*); Magdalena (*Orcutt 1345*).

100. **Cuscuta dentatasquamata** Yuncker

Cuscuta dentatasquamata Yuncker, Bull. Torrey Club **49**: 107. *f. 1.* 1922.

Stems medium to slender. Flowers reddish, 3–4 mm. long, on pedicels shorter than, or mostly about equal to, the flowers, in rather compact, cymose clusters. Calyx deep, lobes exceeding the corolla tube, triangular, acute, slightly overlapping at the base, thickened in the median region, forming a small carina on most of the lobes. Corolla lobes triangular, acute, upright or spreading, shorter than the campanulate tube. Filaments stoutish and about equal to the oval or orbicular anthers. Scales about reaching the stamens, dentate, with few processes, bridged at about the middle, not firmly adherant to the corolla. Styles slender, about equal to, or longer than, the depressed-globose ovary. Capsule large, depressed-globose, thin, somewhat irregularly circumscissile, carrying the withered corolla about it; seeds about 1.5 mm. long, globose, two or four in each capsule, hilum oblong, transverse.

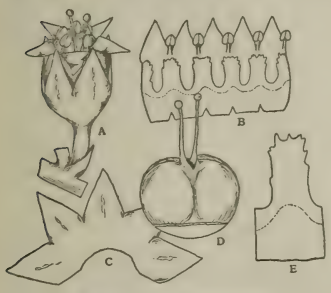

Fig. 100. C. dentatasquamata.

Specimens examined.—Mexico: Los Pinitos, Sonora (*Hartman 119*, the type, in the Gray herbarium). Known only from the type locality.

101. **Cuscuta Hitchcockii** n. sp.

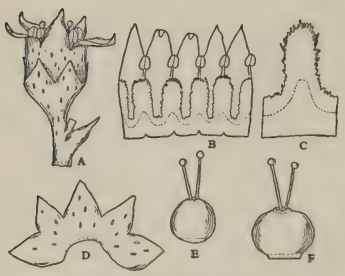

Fig. 101. C. Hitchcockii.

Caules tenuissimi. Flores rubres, glandulosi, 3 mm. longi, breviter pedicellati. Calycis lobi triangulares, acuti. Corollae lobi lanceolati, acuti, apicibus inflexis, breviores quam tubus campanulatus. Scalae oblongae. Styli crassi, longiores quam ovarium globosum. Capsula globosa, circumscissilis.

Stems very slender. Flowers red, glandular, about 3 mm. long, on short pedicels, in paniculate? cymes. Calyx shorter than the corolla tube, lobes triangular, acute, not overlapping, edges sometimes irregular. Corolla lobes lanceolate, acute, spreading, tips often inflexed, edges of the lobes often irregular, somewhat shorter than the campanulate tube. Stamens shorter than the lobes, filaments shorter than the oval-ovate anthers. Scales about reaching the stamens, oblong, bridged, somewhat below the middle, fringed all around with short processes, and also commonly with processes on the bridge. Styles stoutish, longer than the globose ovary which is thickened at the top about the style bases. Capsule globose, circumscissile, enveloped by the withered corolla. Matured seeds not seen.

Specimens examined.—Peru: Mollendo, Arequipa, Desert hills (*A. S. Hitchcock 22425*, the type in the U. S. National Herbarium as sheet 1,195,781). Known only from the type locality.

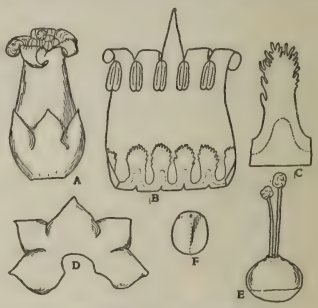

Fig. 102. C. Cockerellii.

102. **Cuscuta Cockerellii** n. sp.

Caules tenues. Flores 4–6 mm. longi, albi, aliquantum glandulosi, sessiles. Calycis lobi late triangulari-ovati, acuti, dimidio breviores quam corollae tubi. Corolla globoso-cylindrata, lobi angusti, lanceolati, acuti. Antherae magnae, oblongae, sessiles. Scalae oblongo-spatulatae, breviores quam dimidium corollae tubi. Styli tenues et multo longiores quam ovarium globosum. Stigmata magna, convoluta. Capsula depresso-globosa, circumscissilis.

Stems slender. Flowers 4–6 mm. long, white, somewhat glandular, sessile in dense, compact, globular clusters. Calyx about half as long as the corolla, slightly granulated, deeply divided, lobes broadly triangular-ovate, acute, overlapping at the base. Corolla globose-cylindrical (tapering from an enlarged base to the narrow throat), lobes narrow, lanceolate, acute, recurved-curling, about half as long as the tube. Anthers large, oblong, sessile. Scales oblong-spatulate, not reaching the middle of the tube, fringed about the upper part with short processes. Styles slender and much longer than the globose, somewhat umbonate, ovary, subexserted, stigmas large and irregularly shaped (globose or somewhat elongated), convoluted. Capsule circumscissile, depressed-globose, somewhat pointed about the style bases, enveloped and capped by the withered corolla; seeds about 1 mm. long, rough, oval, mostly four in a capsule, flattened on two sides.

This species is easily recognized by the swollen base of the corolla tube, recurving corolla lobes, and sessile, oblong anthers.

Specimens examined.—PERU: Yura, near Arequipa (*Cockerell*, August 23, 1925, the type, in the U. S. National Herbarium as sheet 1,231,001). Known only from the type locality.

103. **Cuscuta Choisiana** Yuncker

Cuscuta Choisiana Yuncker, Ill. Biol. Monogr. **6**: 128. *f. 14, 80.* 1921.

Stems slender. Flowers 2.5–4 mm. long, waxy white and sometimes covered with white or transparent, pellucid, glandular appearing cells, mostly nearly sessile, or on pedicels as long as the flowers, clustered in compact clusters, each usually subtended by an ovate-lanceolate bract. Calyx lobes ovate-lanceolate, acute to acuminate, overlapping, about equaling, or exceeding, the corolla tube, spreading somewhat at the tips. Corolla lobes upright to spreading, lanceolate, acuminate, about equaling the cylindrical-campanulate tube. Scales oblong, reaching the filaments, fringed with medium length processes, bridged at about their middle, or below. Stamens slightly shorter than the lobes, anthers ovate, sagittate or oblong, versatile, on very slender filaments, some anthers showing apiculate connective. Ovary globose-ovoid, slightly conic with a thickened region about the intrastylar aperture, styles slender, much longer than the ovary, exserted, stigmas capitate. Capsule globose, circumscissile; seeds two to four in a capsule, ovate-globose, compressed, slightly oblique, hilum short, elliptical, oblique.

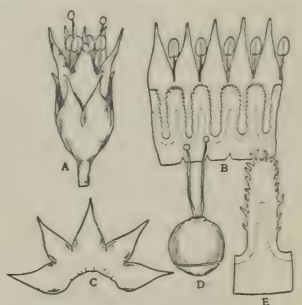

Fig. 103. C. Choisiana.

Central Mexico.

Specimens examined.—Mexico: San Luis Potosi, San-Luis Potosi (*Purpus 4971*, the type, in the U. S. National Herbarium as sheet 842,189); Chapala (*Purpus 5036*).

104. **Cuscuta Ortegana** n. sp.

Flores 5–6 mm. longi, membranacei, sessiles aut subsessiles. Calycis lobi late triangulari-ovati, longi, attenuati, acuminati, longiores quam corollae tubus. Corollae lobi ovati, tenue acuminati, circ. dimidio aliquanto breviores quam tubus cylindratus. Scalae oblongae, dimidio breviores quam tubus corollae. Styli tenuissimi et multo longiores quam ovarium globoso-depressum, exserti. Capsula depresso-globosa, circumscissilis.

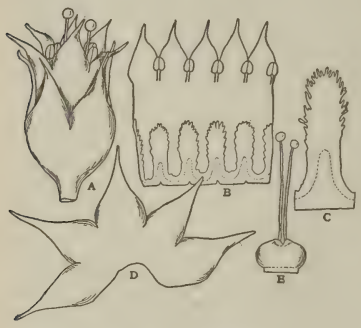

Fig. 104. C. Ortegana.

Stems slender? Flowers 5–6 mm. long, membranous, subtended by a broad, triangular-ovate, acuminate bract, sessile or subsessile in cymose clusters. Calyx loose about the corolla, lobes slightly overlapping at the base, broadly triangular-ovate, with long, attenuated, acuminate tips which are longer than the corolla tube. Corolla lobes ovate, slenderly acuminate, spreading, about half as long as the cylindrical tube. Stamens shorter than the corolla lobes, oval-ovate anthers about as long as the slender filaments. Scales oblong, reaching to about the middle of the corolla tube, fringed about the upper part with short processes, bridged low. Styles very slender and much longer than the globose-depressed ovary, exserted. Capsule depressed-globose, circumscissile, surrounded and enclosed by the withered corolla. Matured seeds not seen.

This species differs from *C. Choisiana* in its larger flowers, and shorter corolla lobes, scales and filaments.

Specimens examined.—Mexico: Durango, Tamazula, alt. 300 meters (*Ortega 4255*, the type in the U. S. National Herbarium as sheet 1,083,541). Known only from the type locality.

105. **Cuscuta partita** Choisy

Cuscuta partita Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 284. *pl. 5. f. 3.* 1841. also in DC., Prodr. **9**: 460. 1845.—Engelman, Trans. Acad. Sci. St. Louis **1**: 487. 1859.—Progel in Martius, Fl. Bras. **7**: 386. *pl. 128. f. 6.* 1871.—Yuncker, Ill. Biol. Monogr. **6**: 130. *f. 12, 118, 156.* 1921. Am. Jour. Bot. **9**: 574. 1922. Not Boldingh.

Stems medium. Flowers 2–3 mm. long, reddish, glandular, on pedicels shorter than, or exceeding, the length of the flowers, in loose, umbellate-racemose, or more densely compact clusters. Calyx shorter than, or exceeding, the corolla tube, lobes ovate-lanceolate, acute to acuminate. Corolla globose-campanulate, furrowed or angled lengthwise along the stamen attachments, producing a saccate condition between the stamen attachments, often granulate, especially the lobes, lobes triangular, or sometimes lanceolate, acute to acuminate, spreading or reflexed, shorter than the tube, with the tips sometimes inflexed. Stamens shorter than the lobes of the corolla, the oval anthers about equal to the slender filaments, or the filaments somewhat subulate and shorter. Scales shorter than the corolla tube, or reaching the stamens in some specimens, bridged slightly below the middle, fringed with medium-length processes. Stigmas comparatively large, slender styles much longer than the globose ovary. Capsule circumscissile (late and irregularly so in some specimens), globose, slightly depressed, carrying the withered corolla about it; seeds roundish, compressed, about 1 mm. long, hilum short, perpendicular.

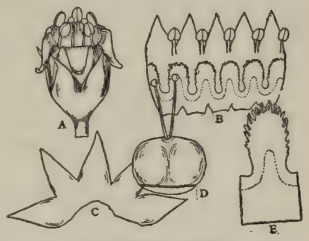

Fig. 105. C. partita.

From Bolivia, Matto Grosso, and Bahia northward to the Danish West Indies. On Leguminoseae, Malvaceae, Euphorbiceae, etc.

Specimens examined.—West Indies:—Curaçao: (*Britton & Shafer 2915; Boldingh 5220; 7081; 5136; Suringar* in 1885).—Bonaire: (*Suringar* in 1885; *Boldingh 7349*).

South America:—Colombia: 'Common in Sabanas of Goajira' (*Dawe 579*); Chiriguana near Lake Sapotoza, Magdalena valley (*Allen 267; 30*).—Venezuela: Around Barquisimeto (*Pittier 6404*).—Bolivia: Cordillera (*Weddell 3611*); Chiquitos (*Weddell 3483*).—Brazil: (*Blanchet 3047*, the type, a specimen in the herbarium of the Missouri Botanical Garden); Prov. Piauhy (*Gardner 2684*); Matto Grosso, Cuyabá (*Lindman A3481; Hoehne 4483; Pilger 369; Riedel 846*, in part); San Luis de Caceres (*Hoehne 1048*); Acre (*Hoehne 1026*); Bahia, Bemanso (*Ule 7149*).

106. **Cuscuta potosina** Schaffner

Cuscuta potosina Schaffner in Watson, Proc. Am. Acad. Arts & Sci. **18**: 124. 1883.
Cuscuta potosina typica Yuncker, Ill. Biol. Monogr. **6**: 130. *f. 28a–f, 88*. 1921.

Stems slender. Flowers about 2 mm. long, subsessile on pedicels shorter than the flowers, in cymose panicles, often 4-parted (infrequently 3-parted). Calyx equal to, or shorter than the corolla tube, lobes triangular acute, or obtusish, in some specimens more or less carinate. Corolla lobes triangular acute, upright, shorter than the campanulate or short cylindrical tube. Scales narrow, oblong, denticulate or fringed about the top, shorter than the tube, or

reaching the filaments, bridged at about a third of their height. Stamens shorter than the lobes, filaments about as long as, or shorter than, the oval to roundish anthers. Styles filiform, as long as, or shorter than, the globose, somewhat ovate or depressed ovary, stigmas small, capitate. Capsule circumscissile with a small, irregular opening, ovoid, with the withered corolla at the top; seeds about 1 mm. long, one to four in a capsule, but more commonly only one, globose, flattened on one side, rounded on the other, finely punctated, hilum linear, oblique.

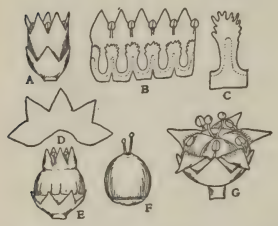

Fig. 106. A-F, C. potosina; G, var. globifera.

Central Mexico.

Specimens examined.—Mexico: San Luis Potosi (*Schaffner 779*), the type, in the Gray Herbarium; 379); Queretaro (*Rose, Painter & Rose 9650*).

Cuscuta potosina globifera Schaffner

Cuscuta potosina globifera Schaffner, in Yuncker, Ill. Biol. Monogr. **6**: 130. *f. 28g–h, 87.* 1921. *Cuscuta globifera* Schaffner in herb.

Flowers larger, commonly 5-parted. Filaments and scales larger. Capsules depressed-globose, surrounded or capped by the withered corolla.

Oaxaca and the Federal District, Mexico northward to New Mexico and Arizona.

Specimens examined.—United States:—New Mexico and Arizona Territory (*Rusby 295*).—New Mexico: vicinity Ute Park, Colfax County, alt. 2200–2900 meters, on *Chenopodium* (*Standley 14050*).—Mexico: San Luis Potosi (*Schaffner 780*, the type, in the Gray Herbarium; *378*); Federal District, Serrano de Ajusco (*Pringle 7245*); Pedrigal, alt. 7300 feet (*Pringle 6575*); Hidalgo, near Tula, alt. 6800 feet (*Pringle 11305*); near Oaxaca (*Purpus 3554*).

Subsection Umbellatae

Flowers mostly pedicellate, forming loose, fasciculate or umbellate inflorescences, Perianth segments acute, entire or lacerated (obtusish in last species). Corolla campanulate, lobes commonly reflexed, equaling or exceeding the tube.

KEY TO THE SPECIES

Flowers ordinarily about 3 mm. or more long (some forms of *C. umbellata* may be smaller), pedicels may be longer than the flowers, but not as strikingly so as below; corolla lobes mostly longer than the tube and reflexed

Flowers lacking infrastaminal scales.....107. *C. hyalina*

Flowers with definite infrastaminal scales.....108. *C. umbellata*

Flowers mostly about 2 mm. long, on long and slender pedicels; corolla lobes longer or shorter than the tube

Calyx lobes longer than broad, mostly lanceolate
Perianth lobes entire
Flowers smooth
Stamens shorter than the corolla lobes.....109. *C. Desmouliniana*
Stamens mostly longer than the corolla lobes.....110. *C. gracillima*
Flowers and stems densely papillate.....111. *C. saccharata*
Perianth segments slender, lacerated or irregularly incised.....112. *C. lacerata*
Calyx lobes ovate, no longer than broad
Calyx lobes ovate, acute, not overlapping, flowers 2–3 mm. long.....
113. *C. fasciculata*
Calyx lobes broadly ovate, obtuse, overlapping, flowers less than 2 mm. long.....
114. *C. deltoidea*

107. Cuscuta hyalina Roth

Cuscuta hyalina Roth; Novae plantarum species praesertim Indiae orientalis ex collectione Doct. Benj. Heynii 100. 1821.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 286. 1841.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 490. 1859. Not Wight nor Boissier.

Cuscuta arabica Wight, Icon. Pl. Ind. Orient. **4**: 14. *pl. 1371.* 1850. Not Fresenius.

Cuscuta Boissieri Stocks, Hooker's Jour. Bot. & Kew Gard. Misc. **4**: 173. 1852.

Cuscuta oxypetala Boissier, Diag. Pl. Or. Nov. II. 3^3: 130. 1856.

Cuscuta acutissima Buchinger Mss. in Pl. Schimper, ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 490. 1859.

Cuscuta Epilribulum Schinz, Bull. Herb. Boiss. II. **1**: 880. 1901.

Stems slender. Flowers 2.5–3.5 mm. long, on pedicels mostly about as long as the flowers (sometimes shorter or sometimes longer), in umbellate cymes, thin, 4- or mostly 5-parted, dried flowers shining and yellowish, often glandular. Calyx deep, more or less turbinate, lobes triangular-ovate, acuminate, exceeding and enclosing the corolla. Corolla campanulate, becoming globular about the developing fruit, lobes upright or spreading and in old flowers may be reflexed, lanceolate, acuminate, mostly longer than the tube. Stamens shorter than the lobes, oval anthers shorter than, or about equaling, the rather stoutish filaments. Scales lacking. Ovary globose, more or less depressed, stigmas capitate, styles slender and equaling or exceeding the ovary. Capsule globose, finally irregularly circumscissile, the lower part of the dissepiment remaining in the, calyx, withered corolla surrounding the upper part of the capsule; seeds oval, about 1.5 mm. long, hilum short, oblong or perpendicular.

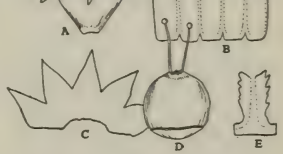

Fig. 107. A-D, C. hyalina; E, var. nubiana.

Tropical India to Abyssinia, Kordofan, and southern Africa. On *Tribulus*, *Trianthema* and many other herbaceous hosts.

Type.—'India orientali' (*Heyne.* Not seen).

Specimens examined.—India: (*Munby; hb. Wight 2008*); Madras (*Wallich 1320*); Anantapur (*Gamble 21149*); Bombay (*Dalzell*); Punjab, Lahore (*Kashyap* in 1922); Shahpur (*Mulchaud 14702*); southern India (*Thomson*); Sind, Karachi (*Stocks 478*, the type of *C. Boissieri;* in 1851).—Baluchistan: (*Frere* in 1857; *Stocks* in 1851).—Abyssinia: (*Schimper 1522*).—Kordofan: (*Pfund 146; État-Major Général Égyptien Expéd. 299*).—German Southwest Africa; Okahandya (*Dinter* in 1923, with larger flowers and longer pedicels); southern tropical Africa (*Baines* in 1863).

Cuscuta hyalina nubiana n. var.

Scalae redimentariae adsunt.

Scales present as a fringe of few teeth along the sides of the stamen attachment, or free in a few flowers. I can see no other differences between this and *C. hyalina.*

Specimens examined.—Africa: 'Nubische Küste' (*Schweinfurth 964*, the type, in the Boissier herbarium).

108. **Cuscuta umbellata** Humboldt, Bonpland & Kunth

Cuscuta umbellata Humboldt, Bonpland & Kunth, Nov. Gen. et Sp. Pl. **3**: 121 (95 in folio edition). 1818.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 284. 1841. also in DC., Prodr. **9**: 460. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 487. 1859.—Progel in Martius, Fl. Bras. **7**: 386, *pl. 128. f. 7, 8.* 1871.—Yuncker, Ill. Biol. Monogr. **6**: 137. 1921.—also Am. Jour. Bot. **9**: 575. 1922.

Cuscuta parviflora Willdenow hb. 3163.

Cuscuta umbellata typica Yuncker, Ill. Biol. Monogr. **6**: 132, *f. 9a–e, 115, 149.* 1921.

Stems slender. Flowers smooth, or infrequently slightly puberulent, 2–3 mm. long, on pedicels longer or shorter than the flowers, forming rather dense, compound cymes, the ultimate umbellate divisions of 3–7 flowers. Calyx turbinate, as long as, or longer than, the campanulate corolla, lobes triangular-ovate, acute to acuminate. Corolla lobes as long as, or longer than, the tube, reflexed, lanceolate, acute to acuminate. Scales somewhat obovate or spatulate, moderately fringed with medium length processes, reaching the filaments or slightly exserted, bridged at about a third or less of their height. Stamens shorter than the lobes, anthers oblong to oval, shorter than or equaling the filaments. Styles longer than the globose ovary, stigmas capitate. Capsule globose, depressed, with a ring or collar of thickened knobs about the intrastylar aperture, circumscissile (sometimes tardily so), surrounded by the withered corolla; seeds about 1 mm. long, angled, oblique, oval, hilum oblong, linear, transverse.

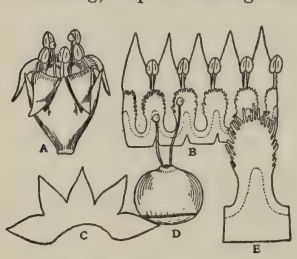

Fig. 108. C. umbellata.

In the southern United States, the West Indies, Mexico and northern South America. On a large number of different harbaceous hosts, as *Boerhaavea, Portulacca, Kallstroemia, Amaranthus, Atriplex, Polygonum, Euphorbia, Bryophyllum, Suaeda, Alternanthera, Sesuvium*, etc.

Type.—'Crescit in Nova Hispania, inter Queretaro et Salamanca' (*Humboldt*, a fragment in the herbarium of the Missouri Botanical Garden).

Cuscuta umbellata reflexa (Coulter) Yuncker

Cuscuta umbellata reflexa (Coulter) Yuncker, Ill. Biol. Monogr. **6**: 132. *f. 114.* 1921.
Cuscuta californica reflexa Coulter, Contrib. U. S. Nat. Herb. **1**: 45. 1890.

Flowers large (4–6 mm. long); corolla lobes lanceolate, upright to reflexed; scales profusely fringed about the top, spatulate, their lower half so firmly adherent to the tube as to make it difficult to detach them for study.

The large size of the flowers and the compact clusters distinguish this variety.

Texas, Arizona and northern Mexico.

Type.—Texas: Roma, (*Nealley 338*, in the U. S. National Herbarium as type sheet 1,192).

Cuscuta umbellata dubia Yuncker

Cuscuta umbellata dubia Yuncker, Ill. Biol. Monogr. **6**: 133. *f. 9f–g.* 1921.

Stems very slender. Flowers about 2 mm. long; calyx lobes triangular, acute, forming angles at the sinuses; corolla lobes about equal to the tube, spreading, triangular-oblong, acute.

Type.—Mexico: Guaymas, Sonora, on the sea beach (*Palmer 1209*, in the U. S. National Herbarium as sheet 474,815). Known only from the type locality.

Cuscuta umbellata desertorum Engelmann

Cuscuta umbellata desertorum Engelmann, Trans. Acad. Sci. St. Louis **1**: 488. 1859.
Cuscuta umbellata maritima Progel, in Martius, Fl. Bras. **7**: 387. 1871.
Cuscuta desertorum Martius, in herb.

Flowers small (about 2 mm. long); scales bifid, entire, or reduced; capsule somewhat exposed. The corolla lobes do not appear to be twice as long as the tube nor are the flowers particularly long pedicellate, as indicated by Engelmann.

Brazil and island of Antigua.

Specimens examined.—Brazil: Prov. of Piauhy 'on *Portulacca* and *Ehrenbergia*' (*Martius*, the type, a specimen in the herbarium of the Missouri Botanical Garden); Prov. Ceara (*Gardner 2425*).—Island of Antigua: (*Wullschlaegel 352*. This has more exposed and especially glandulous capsules and broader flowers.)

109. **Cuscuta Desmouliniana** Yuncker

Cuscuta Desmouliniana Yuncker, Ill. Biol. Monogr. **6**: 130. 1921.

Cuscuta Desmouliniana typica Yuncker, Ill. Biol. Monogr. 6: 131. *f. 25a–e, 67.* 1921.
Cuscuta Desmouliniana attenuiloba Yuncker, Ill. Biol. Monogr. 6: 131. *f. 25f–h.* 1921.

Stems slender. Flowers slightly papillate, about 2 mm. long, mostly 5-parted, on pedicels as long as, or longer than, the flowers. Calyx lobes triangular or lanceolate, acute to acuminate, longer than the corolla tube and more or less spreading at the tips. Corolla lobes longer than the campanulate tube, erect to spreading and sometimes reflexed in fruit, lanceolate, acuminate. Scales shorter than the tube, oblong, sparingly fringed with short processes about the upper part, or reduced to wings on either side of the filament attachment. Stamens shorter than the lobes, filaments longer than the small, oval to oblong anthers. Styles longer than the small, globose ovary, stigmas capitate. Capsule with the withered corolla at the top, globose, thin, circumscissile, usually three-seeded; seeds roundish-ovoid, about 1 mm. long, compressed, angled, hilum short, oblong, oblique.

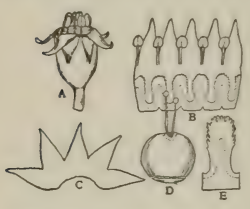

Fig. 109. C. Desmouliniana.

This species is closely allied with *C. umbellata*. It seems to differ, however, in the smaller flowers, commonly more deeply divided calyx and with the withered corolla at the top of the capsule.

Specimens examined.—Mexico: Sonora, hills near Altar, on *?Euphorbia*. (*Pringle 105*, the type, in the Columbia College herbarium, now at the New York Botanical Garden). Known only from the type locality.

110. **Cuscuta gracillima** Engelmann

Cuscuta gracillima Engelmann, Trans. Acad. Sci. St. Louis 1: 488. 1859.—Yuncker, Ill. Biol. Monogr. 6: 133. 1921.
Cuscuta foetida Hooker & Arnott, Bot. Beechy Voy. 304. 1838. Not H. B. K.
Cuscuta subtilis Chaubard in herb.
Cuscuta gracillima subtilis (Chaubard) Yuncker, Ill. Biol. Monogr. 6: 133. *f. 17a–e, 82.* 1921.

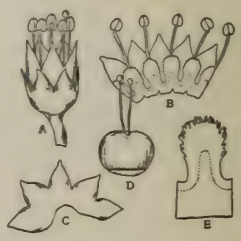

Fig. 110. C. gracillima.

Stems very slender, disappearing early from between the flower clusters. Flowers smooth, about 2 mm. long, on pedicels sometimes shorter, but mostly longer than the flowers, in dense, much branched clusters. Calyx turbinate, lobes triangular-lanceolate, acute to acuminate, longer than the corolla tube. Corolla lobes about as long as, or slightly longer than, the campanulate or funnel-form tube, triangular to lanceolate, acute. Scales ovate,

fringed, longer, than the tube, bridged at about, or below, the middle. Stamens longer than the lobes, filaments very slender, anthers oblong or oval, somewhat versatile. Ovary small, globose, styles capillary, many times the length of the ovary. Capsule tardily and irregularly circumscissile, depressed-globose, thin, surrounded by the withered corolla; seeds about 1 mm. long, one to four in a capsule, ovate, somewhat oblique, hilum oblong, oblique.

Western and southern Mexico.

Specimens examined.—Mexico: (*Mornay*, the type, in the Delessert herbarium; *Beechy*, the type of *C. foetida* H & A, in the Kew herbarium); Colima, Manzanillo (*Palmer 949*); Morelos, valley near Yantepec, alt. 4500 ft. (*Pringle 8716*); by-lanes of Cuernavaca, alt. 5000 ft. (*Pringle 6189*); Sinaloa, Mazatlan (*Wright 1264; Rose, Standley & Russell 13727a; 13804*); Road between Juchitango and Ometepec, Guerrero (*Nelson 2321.* This specimen has somewhat larger flowers and with the stamens about equaling the corolla lobes, as in *C. saccharata*, but with smooth flowers.)

Cuscuta gracillima esquamata Yuncker

Cuscuta gracillima esquamata Yuncker, Ill. Biol. Monogr. **6**: 133. 1921.

Flowers frequently 4-parted; corolla somewhat glandular; scales lacking, or reduced to but a few short processes.

Specimens examined.—Mexico: El Taste, Lower California (*Brandegee* in 1893, the type, in the University of California herbarium). Known only from the type locality.

111. Cuscuta saccharata (Engelmann) n. sp.

Cuscuta gracillima saccharata Engelmann, Trans. Acad. Sci. St. Louis **1**: 489. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 133. *f. 17f–g, 81.* 1921.
Cuscuta Sidarum Liebmann, in herb.

Caules tenuissimi. Flores 2–2.5 mm. longi, dense papillati, Pediculi tenues, longi. Calycis lobi ovati-lanceolati, acuminati aut acuti. Corollae lobi circ. tubo campanulato aequantes. Stamina breviora quam corollae lobi. Scalae ovatae. Styli tenues; longiores quam ovarium globosum. Capsula globosa, circumscissilis.

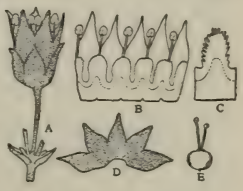

Fig. 111. C. saccharata.

Stems very slender. Flowers 2–2.5 mm. long, densely papillate, (also the pedicels, bracts and stems), on slender pedicels longer than the flowers, in dense, compact fascicles of umbellate-cymose clusters. Calyx about enclosing the corolla tube, lobes ovate-lanceolate, acuminate or acute. Corolla lobes upright or spreading, about equal to the campanulate tube. Stamens shorter than the lobes, the slender filaments longer than the oval anthers. Scales ovate, reaching the stamens, bridged at about the middle, fimbriated with short processes. Styles

slender, longer than the globose ovary. Capsules globose, thin, carrying the withered corolla about the top, irregularly circumscissile; seeds about 1 mm. long, oval, hilum short, oblong.

This species is closely related to *C. gracillima*, from which it differs in the papillate flowers and shorter stamens.

Southern Mexico and Costa Rica.

Specimens examined.—Mexico: 'On the coast of Oaxaca, parasitic on different species of *Sida*' (*Liebmann*, the type, in the Kew herbarium); Guerrero, Acapulco and vicinity (*Palmer 51*).—Costa Rica: Esparta, alt. 300 meters (*Molina* in 1923).

112. **Cuscuta lacerata** Yuncker

Cuscuta lacerata Yuncker, Ill. Biol. Monogr. **6**: 134. *f. 18.* 1921.

Stems slender. Flowers smooth, 5-parted, about 2 mm. long, on pedicels as long as, or longer than, the flowers, in dense, congested, paniculate cymes, the ultimate divisions umbellate. Calyx exceeding the shallow, campanulate corolla; lobes uneven, lanceolate, acuminate, with irregular, deep lacerations. Corolla lobes much exceeding the tube, narrowly lanceolate, acuminate, lacerated. Scales exserted, somewhat spatulate, fringed, bridged at about a fourth of their height. Stamens shorter than the lobes, anthers ovate-oblong, rather shorter than the slenderly tapering filaments, somewhat versatile. Ovary globose, slightly thickened at the top, styles slender, much longer than the ovary. Capsule globose, with a slightly thickened collar about the intrastylar aperture, bearing the withered corolla about the top; seeds one to four in a capsule, oval, somewhat compressed, hilum small, transverse?.

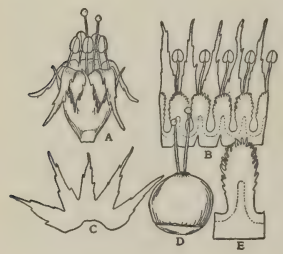

Fig. 112. C. lacerata.

This species is well characterized by its long, narrow and lacerated lobes of the calyx and corolla. In no other species have such deep incisions been seen.

Specimens examined.—Mexico: Cuicatlan (*Smith 406*, the type, in the Gray herbarium). Known only from the type locality.

113. **Cuscuta fasciculata** n. sp.

Caules tenuissimi. Flores 2–3 mm. longi, longe pedicellati, cymis umbellato-fasciculatis. Calycis lobi triangulari-ovati, acuti. Corolla campanulata, lobis oval-ovatis, acuta aut obtusa, reflexa. Filamenta tenua. Scalae late spatulatae. Styli tenues, longiores quam ovarium globosum. Capsula depresso-globosa, circumscissilis.

Stems very slender. Flowers 2–3 mm. long, on pedicels often several times as long as the flowers, in congested, umbellate-fasciculate cymes. Calyx about enclosing the corolla tube, lobes triangular-ovate, not overlapping, acute. Corolla lobes oval-ovate, not overlapping at the base, edges somewhat irregular, acute, or, often in the same flower, obtuse, nearly as long as the campanulate tube, reflexed, granulated towards the commonly inflexed tip. Stamens nearly as long as the corolla lobes, filaments slender and longer than the oval anthers. Scales scarcely reaching the stamens, broadly spatulate with a narrow 'shank,' fringed about the upper part with short processes, bridged low. Ovary globose, slightly pointed about the style bases, styles slender, longer than the ovary, exserted. Capsule depressed-globose, circumscissile, surrounded by the withered corolla; seeds 3–4 in a capsule, sub-globose, about 1 mm. long, hilum short, subterminal.

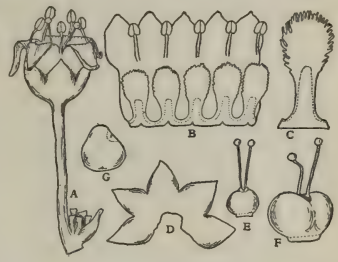

Fig. 113. C. fasciculata.

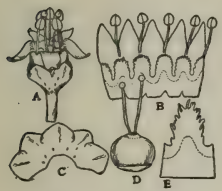

Fig. 114. C. deltoidea.

From *C. umbellata* this species differs in its more rounded, rather than turbinate, calyx, broader, oval-ovate, often obtusish (not lanceolate) corolla lobes which are sometimes shorter than the corolla tube, and shorter scales and longer filaments.

Specimens examined.—New Mexico: Santa Fe (*Bro. Bertand 48*, the type, in the U. S. National Herbarium as sheet 891,071). Known only from the type locality.

114. **Cuscuta deltoidea** Yuncker

Cuscuta deltoidea Yuncker, Ill. Biol. Monogr. **6**: 134. *f. 15, 122.* 1921.

Stems very slender. Flowers smooth, 5-parted, short (mostly less than 2 mm. long), on pedicels much longer than the flowers, in congested, cymose-paniculate clusters. Calyx shallow, lobes short, broadly ovate, obtuse, overlapping, somewhat verrucose. Corolla campanulate, lobes triangular-ovate, acute, becoming reflexed. Scales shorter than the tube, or reaching the filaments, fringed with medium length processes, bridged at about the middle. Stamens slightly longer, or about equaling the corolla lobes, anthers oval, shorter than the filaments, slightly versatile. Styles longer than the globose ovary, becoming exserted, stigmas capitate. Capsule depressed-globose, with

a thickened collar about the intrastylar aperture, circumscissile; matured seeds not seen.

This species differs from *C. gracillima*, which it resembles somewhat, in the more triangular-ovate corolla lobes and the short, broadly obtuse, overlapping calyx segments.

Central Mexico.

Specimens examined.—Mexico: Colima, Manzanillo (*Palmer 948*, the type, in the U. S. National Herbarium as sheet 208,677); volcanic hills, Monte Leon, State of Michoacan (*Pringle 5350*).

Subsection Leptanthae

Flowers often 4-parted, pedicellate, in loose clusters. Calyx much shorter than the cylindrical corolla tube, tuberculate, papillate or smooth. Corolla lobes mostly shorter than the tube.

KEY TO THE SPECIES

Calyx lobes keeled or tuberculate, exceeding the middle of the corolla tube, flowers mostly 5-parted ..... 115. *C. tuberculata*

Calyx not keeled or tuberculate, often not exceeding the middle of the corolla tube, 4- or 5-parted

Flowers 3–4 mm. long, calyx and corolla papillate, corolla lobes nearly, or as long as the corolla tube ..... 116. *C. leptantha*

Flowers longer, corolla lobes about half as long as the tube, flowers smooth or but sparingly papillate ..... 117. *C. polyanthemos*

115. Cuscuta tuberculata Brandegee

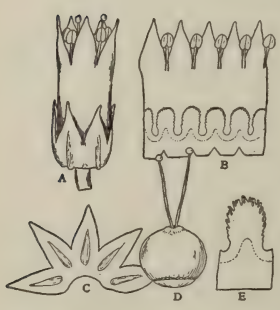

Fig. 115. C. tuberculata.

Cuscuta tuberculata Brandegee, Univ. Calif. Bot. Publ. **3**: 389. 1909. Yuncker, Ill. Biol. Monogr. **6**: 135. *f. 20, 78*, 1921.

Stems slender. Flowers 2.5–4 mm. long, 5-parted, on pedicels longer or shorter than the flowers, in umbellate-racemose clusters. Calyx about half to three-fourths as long as the cylindrical corolla tube, lobes triangular to somewhat lanceolate, acute, often keeled, giving the calyx somewhat of an angular appearance. Corolla lobes equal to, or shorter than, the tube, upright, triangular-acute, the basal portion of the corolla papillate, especially that part enclosed by the calyx. Scales about reaching the middle of the tube, or sometimes longer, ovate, fringed with short processes, bridged at about the middle. Stamens shorter than the lobes, or slightly longer, in some specimens, anthers oblong,

linear, shorter than, or equaling, the filaments. Ovary small, globose, pointed, with a thickened ring about the intrastylar aperture, styles much longer than the ovary, exserted. Capsule globose, umbonate, circumscissile, with the withered corolla at the top; fully matured seeds not seen.

New Mexico and northern Mexico.

Specimens examined.—New Mexico: Gila Valley (*Greene*, 3 collections in 1880).—Mexico: Sonora, Northwestern Mts. (*Pringle* in 1884); Bavispe (*Hartman 179*); Lower California (*Brandegee* in 1915); Santa Margarita Island (*Brandegee*, the type, in the University of California herbarium as sheet 124,474); San José (*Brandegee 404; Grabendorfer* in 1899); Pescadero (*Brandegee* in 1893); West coast of Cape region (*Brandegee* in 1893).

116. **Cuscuta leptantha** Engelmann

Cuscuta leptantha Engelmann, Trans. Acad. Sci. St. Louis **1**: 489. 1859.
Cuscuta Palmeri Watson, Proc. Am. Acad. Arts & Sci. **24**: 64. 1889.
Cuscuta leptantha typica Yuncker, Ill. Biol. Monogr. **6**: 135. *f. 24a–e.* 1921.
Cuscuta leptantha Palmeri (Watson) Yuncker, Ill. Biol. Monogr. **6**: 136. *f. 34f, 91.* 1921.
—Johnstone, Proc. Calif. Acad. Sci. VI. **12**: 1131. 1924.

Stems very slender. Flowers 3–4.5 mm. long, mostly 4-parted, on pedicels as long as, or longer than, the flowers, in umbellate clusters. Calyx short, campanulate, lobes triangular-ovate, acute, somewhat fleshy, papillose, about reaching the middle of the corolla tube. Corolla cylindrical, fleshy and papillose in the basal part, lobes nearly as long as the tube, upright to reflexed, slightly fleshy, triangular, or lanceolate, acute. Scales oblong, truncated or somewhat deltoid, shorter than the tube, fringed with short processes, bridged at about a quarter or a half of their height. Stamens somewhat shorter than the lobes, anthers oval, shorter than the slender filaments. Styles slender, much longer than the ovoid ovary, exserted, stigmas capitate. Capsule globose, slightly umbonate, two to four-seeded, circumscissile, capped with the withered corolla; seeds about .8 mm. long, ovate, oblique, compressed, angled, hilum short, oblique or transverse.

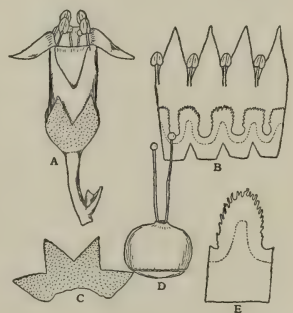

Fig. 116. C. lepthantha.

This species closely resembles *C. tuberculata* in some respects, but differs in having more papillate and mostly 4-parted flowers with shorter and commonly more ovate-triangular calyx lobes.

Texas and New Mexico to central Mexico and Lower California. Often on *Euphorbia*.

Specimens examined.—Texas: Western Texas to El Paso (*Wright 522*, the type, in the herbarium of the Missouri Botanical Garden); San Antonio (*Mr. & Mrs. Clemens 147*); Praires of the Leona (*Wright* in 1852); Eagle Pass (*Havard 4; Howard* in 1888).—New Mexico: (*Wright 1639*); Rio Gila (*Green 275*); Sierra County (*Metcalf 1290?*).—Mexico: Lower California, Los Angeles Bay (*Palmer 544*, the type of *C. Palmeri*); LaPaz (*Palmer 16; Brandegee 406*); Baja, San Nicholas Bay (*Johnston 3707*); Sinaloa, Culiacan (*Rose, Standley & Russell 14929*).

117. **Cuscuta polyanthemos** Schaffner

Cuscuta polyanthemos Schaffner, in Yuncker, Ill. Biol. Monogr. **6**: 136. *f. 31, 92.* 1921.

Stems very slender. Flowers smooth, 4–5 mm. long, 4- or 5-parted, in umbellate clusters, on pedicels usually two or more times as long as the flowers. Calyx short, not over half as long as the corolla tube, lobes triangular, acute. Corolla tube 4–5 mm. long, cylindrical, slightly tapering towards the base, lobes triangular, lanceolate, acute, spreading to reflexed, about half as long as the tube. Scales shorter than the tube, reaching to about the middle, sparingly fringed with short processes, bridged at about one-third their height. Stamens shorter than the lobes, anthers oblong-oval, shorter than the slightly subulate filaments. Ovary globose, slightly pointed, with a thickened collar about the intrastylar aperture, styles many times the length of the ovary, exserted, stigmas capitate. Capsule globose, slightly pointed, with the withered corolla carried at the top, somewhat glandular, circumscissile, leaving the obcordate dissepiment in the calyx; seeds about 1 mm. long, usually four in each capsule, oval, angled, hilum oblong, oblique.

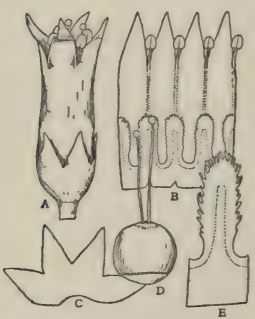

Fig. 117. C. polyanthemos.

From *C. leptantha*, with which this species is closely allied, it differs mainly in the greater length of flowers and pedicels.

Northwestern Mexico.

Specimens examined.—Mexico: Sinaloa, Culiacan (*Schaffner*, the type, in the herbarium of the New York Botanical Garden; *Brandegee* in 1904).

Subsection Lepidanchopsis

Cuscuta subsection *Lepidanchopsis* Yuncker, Ill. Biol. Monogr. **6**: 119. 1921.

Flowers sessile in compact, more or less continuous clusters, subtended by numerous bracts. Calyx lobes distinct or nearly so, obtuse, or acute.

KEY TO THE SPECIES

Bracts and calyx lobes broad, obtuse
- Styles stout, slightly subulate, not greatly exceeding the ovoid or pyriform capsule, scales moderately fimbriated with medium length processes...118. *C. strobilacea*
- Styles slender and much longer than the globose capsule, scales very profusely fimbriated with long, slender processes.....119. *C. goyaziana*

Bracts and calyx lobes sharply acute
- Stigmas oval-elongated, scales about reaching the anthers.....120. *C. bracteata*
- Stigmas globose, scales shorter than the tube.....121. *C. serrata*

118. **Cuscuta strobilacea** Liebmann

Cuscuta strobilacea Liebmann, Forhandl. skand. Naturf. Christiana p. 194. 1847.
Cuscuta Pringlei Yuncker, Ill. Biol. Monogr. 6: 119. *f. 13, 119, 152.* 1921.

Stems medium. Flowers smooth, subsessile to sessile, about 4 mm. long, 5-parted, compacted into dense, elongated clusters about the host plant much as in *C. glomerata*, or more loosely paniculate, flower parts somewhat fleshy ("beautifully white and very agreeable aroma"—Fink). Calyx segments slightly united, ovate, cupped, appressed to the corolla, overlapping, subtended by several unequal bracts of about the same shape as the calyx lobes, edges of the bracts and calyx lobes irregular and the thickened median portion reddish. Corolla lobes oblong-ovate, spreading, about as long as the campanulate tube and with the edges slightly uneven. Scales ovate, about reaching the filaments, copiously fringed with medium length processes, bridged at, or slightly above, the middle. Stamens shorter than the lobes, anthers oblong, about as long as, or shorter than, the filaments. Ovary globose-conic, becoming umbonate, styles subulate, longer than the ovary, exserted in fruit. Capsule umbonate, thickened at the top, circumscissile with a slightly irregular edge, leaving the obcordate dissepiment in the persistent calyx; seeds usually three or four in a capsule, about 1.5 mm. long, angled, oval or roundish, light brown or chocolate brown, hilum short, oblong, oblique to transverse, or reduced to a dot.

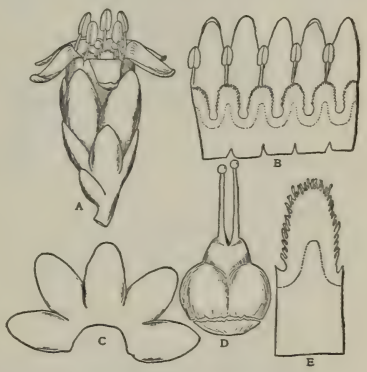

Fig. 118. C. strobiliacea.

A very striking and easily recognized species and the only one from North America belonging in this subsection.

Southern Mexico.

Specimens examined.—Mexico: Vera Cruz, Mirador, on *Triumfetta* (*Liebmann* Feb. 1842, the type, in the Botanical Museum at Copenhagen); Cordoba (*Fink*); Zacuapan (*Purpus 8175*); Jalisco, hillside near Guadalajara (*Pringle 2472*, the type of *C. Pringlei*, in the U. S. National Herbarium as sheet 49,852).

119. **Cuscuta goyaziana** Yuncker

Cuscuta goyaziana Yuncker, Am. Jour. Bot. **9**: 568. *pl. 3. f. 13a–e.* 1922.

Stems medium. Flowers 4–5 mm. long, yellowish-orange in color, somewhat fleshy and thick in texture, with yellowish, pellucid, glandular-appearing cells, sessile, surrounded by one to three ovate, obtuse bracts. Calyx as long as the corolla, sepals distinct or nearly so, ovate, obtuse, overlapping. Corolla lobes ovate, obtuse, or slightly acutish, about as long as, or somewhat shorter than the cylindrical or somewhat campanulate tube, overlapping, spreading or reflexed. Stamens shorter than the lobes, filaments about as long as the large, oval anthers. Scales prominent, exserted, bridged at about the middle, profusely fringed with long processes. Styles slender, much longer than the globose ovary, stigmas globose. Capsule globose, circumscissile, with a thickened collar about the intrastylar opening, carrying the withered corolla about the upper half; seeds about 2 mm. long, ordinarily four in each capsule, oval or ovate, hilum short, linear, perpendicular.

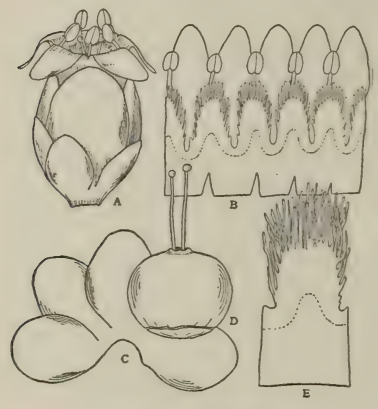

Fig. 119. C. goyaziana.

The number of bracts present in this species varies considerably in the different flowers and it may be that with more abundant materials some flowers will be found without them.

Specimens examined.—Brazil: Prov. Goyaz (*Glaziou 21810*, the type, in the herbarium of the Botanical Institute at Dahlem).

120. **Cuscuta bracteata** Engelmann

Cuscuta bracteata Engelmann, Trans. Acad. Sci. St. Louis **1**: 509. 1859.—Yuncker, Am. Jour. Bot. **9**: 569. *pl. 3. f. 16a–e.* 1922.

Stems coarse or medium. Flowers reddish, 5–6 mm. long, sessile, or subsessile in loose, spicate, or paniculate, clusters, subtended by two to five ovate, obtusish or, mostly, acute, sometimes cuspidate bracts, flower parts serrulate, and with numerous pellucid, glandular-appearing cells. Sepals distinct, ovate, acute, sometimes cuspidate, as long as the corolla tube. Corolla lobes upright, spreading, or reflexed, ovate-lanceolate, acute, not quite as long as the sub-cylindrical tube. Stamens shorter than the corolla lobes, filaments nearly equal to the oval or oblong anthers. Scales reaching the stamens, abundantly fringed with long processes, bridged at about the middle. Styles slender, longer than the globose ovary, stigmas oval-elongated. Capsule globose-ovoid, circumscissile, membranous, carrying the withered corolla about the top; seeds 2–2.5 mm. long, 2–4 in each capsule, ovoid, hilum short, longitudinal.

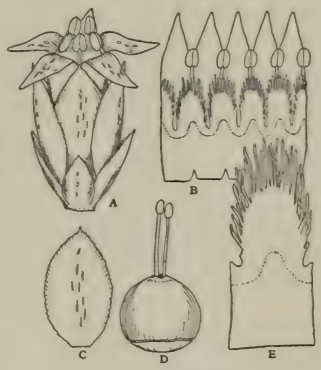

Fig. 120. C. bracteata.

This species is readily distinguished from related forms by the elongated stigmas.

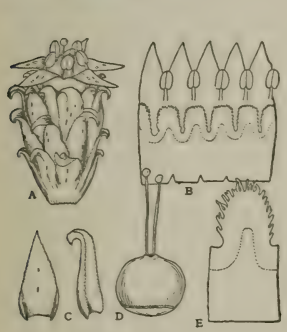

Fig. 121. C. serrata.

Specimens examined.—Brazil: Goyaz, 'parasitic on shrubs' (*Gardner 3348*, the type, in the Kew Herbarium). Known only from the type locality.

121. **Cuscuta serrata** Yuncker

Cuscuta serrata Yuncker, Am. Jour. Bot. **9**: 569, *pl. 3 f. 17a–e.* 1922.

Stems medium or slender, soon disappearing from between the floral masses. Flowers about 5 mm. long, yellowish or reddish, sessile, in dense, compact, globular or elongated, closely adherent clusters, surrounded by many (5–15) ovate-lanceolate, acute or acuminate bracts, all parts of the flowers serrated and having many pellucid, glandular-appearing cells. Sepals distinct, ovate-laceolate, acute or acuminate, sometimes cuspidate, as long as the corolla tube, more or less squarrose, bract and sepal tips sometimes recurving. Corolla lobes ovate, acute to acuminate, sometimes cuspidate, overlapping, shorter than the cylindrical tube, or about

equal to it, upright or spreading. Stamens shorter than the lobes, filaments shorter than, or equaling, the oval-oblong anthers. Scales mostly not reaching the stamens, bridged at, or slightly above, the middle, fringed with medium-length processes. Styles slender, longer than the globose-ovoid ovary, stigmas globose. Capsule globose-ovoid, circumscissile, carrying the withered corolla about the top; seeds 1–1.25 mm. long, roundish, hilum linear.

This species differs from *C. bracteata*, with which it is closely allied, in the shape of the stigmas, bracts, sepals and scales and also in the type of inflorescence. Superficially it much resembles *C. glomerata* but is sufficiently distinct with its circumscissile capsule.

Central Brazil in the provinces of Goyaz and São Paulo.

Specimens examined.—Brazil: Prov. Goyaz (*Glaziou 21811*, the type, in the herbarium of the Botanical Institute at Dahlem; *21811½*); near Sobradinho, on Myrtaceae (*Ule 3009*). Prov. São Paulo, Pyreneos Mts., on Myrtaceae (*St. Hilaire C7711*).

Subgenus **Monogyna**

Cuscuta group *Monogyna* Engelmann, Trans. Acad. Sci. St. Louis **1**: 460. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 110. 1921.

?Kadurias Rafinesque, Fl. Tellur. **4**: 91. 1836.

?Aplostylis Rafinesque, Fl. Tellur. **4**: 91. 1836.

Monogynella Des Moulins, Études Org. Cusc. 65. 1853.

Stems very coarse. Flowers sessile or on short pedicels, in spicate, racemose or paniculate cymes; the withered corolla remaining at the top of the regularly circumscissile capsule, or easily dropping off; styles thick, mostly completely united, stigmas capitate, subglobose, to ovoid, or conic. Commonly parasitizing woody hosts. Mostly Old World species, one only being found in North America and one from Africa.

KEY TO THE SECTIONS

Styles as long as, or mostly much longer than the stigmas.....Monogynella p. 248
Styles mostly shorter than the elongated stigmas.....Callianche p. 259

Section Monogynella

Cuscuta section *Monogynella* Engelmann, Trans. Acad. Sci. St. Louis **1**: 512. 1859.—Yuncker, Ill. Biol. Monogr. **6**: 110. 1921.

Flowers sessile, or short pedicellate, in spicate or racemose cymes; stigmas globose, ovate, conic, or flattened; styles mostly completely united, (partially free in *C. exaltata* and *C. japonica fissistyla*). The stamens are commonly sessile and situated at or, more often, below the sinus.

KEY TO THE SPECIES

Stamens sessile or subsessile at the sinuses
Stigmas flattened-depressed
Styles often united only part of their length or easily separating when pulled...
122. *C. exaltata*

Styles entirely united
Scales free, or reduced, mostly shallowly and irregularly dentated.....
123. *C. cassytoides*
Scales a narrow ridge, and extending to the anthers.....124. *C. timorensis*
Stigmas oval or conic, styles as long as the ovary, or longer....125. *C. japonica*
Stamens sessile or subsessile definitely below the sinuses
Scales, at most, about reaching the middle of the tube
Stigmas globose, or short conic, styles much longer than the stigmas.....
126. *C. lupuliformis*
Stigmas elongated, conic or liguliform, style about as long as the stigmas..
127. *C. gigantea*
Scales longer, usually about reaching the anthers
Scales a narrow ridge, scarcely reaching the anthers
Calyx about enclosing the corolla.....128. *C. monogyna*
Calyx short, not exceeding the middle of the tube.....
C. Lehmanniana esquamata
Scales prominent and covering the base of the anthers...129. *C. Lehmanniana*

122. **Cuscuta exaltata** Engelmann

Cuscuta exaltata Engelmann, Trans. Acad. Sci. St. Louis 1: 513. 1859.—Yuncker, Ill. Biol. Monogr. 6: 111. *f. 6, 62, 63.* 1921.
Cuscuta gamostyla Engelmann, Trans. Acad. Sci. St. Louis 1: 513. 1859, in synon.

Stems thick and stout (1–2 mm.). Flowers smooth, 4–5 mm. long, 5-parted, sessile or subsessile in spicate panicles. Calyx lobes fleshy, thick, concave, ovate-orbicular, obtuse, overlapping, nearly as long as, or equaling the corolla tube. Corolla tube cylindrical, with only the lobes exserted from the calyx, lobes ovate-orbicular obtuse, overlapping. Stamens included, sessile at the throat, anthers overlapping. Stamens included, sessile at the throat, anthers ovate. Scales composed of two wings, one on either side of the filament attachment, or free and dentate or emarginate, bridged at about the middle, toothed along the upper part. Styles as long as the globose ovary, partially or completely united, but easily separating when pulled, stigmas flattened. Capsule ovate-globose, circumscissile, 5–7 mm. long, carrying the withered corolla at the top; seeds about 3–3.5 mm. long, somewhat rostrate and triangular, hilum oblong, oblique to transverse.

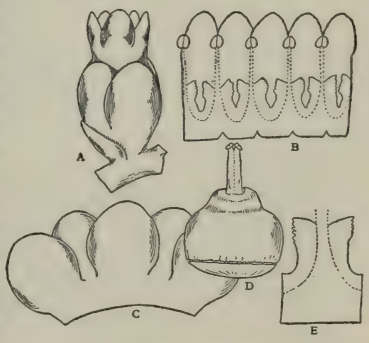

Fig. 122. C. exaltata.

Texas and Florida. On *Quercus, Vitis, Diospyros, Ulmus, Juglans, Rhus*, etc.

Specimens examined.—Texas: New Braunfels (*Lindheimer 472*, the type, a specimen in the herbarium of the Missouri Botanical Garden); on the Cibola near San Antonio (*Lindheimer* in 1846); at the mouth of the Pecos (*Bigelow* in 1851); Sallas County (*Reverchon 663; 2552;* in 1875; in 1880); On the Blanco (*Wright* in 1847); western Texas (*Nealley 260*); Bexar County (*Jermy* in 1904).—Florida: Volusia County (*Baker* in 1908).

123. **Cuscuta cassytoides** Nees von Esenbeck

Cuscuta cassytoides Nees von Esenbeck, Linnaea **20**: 196. 1847 without description.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 513. 1859.—Harvey, Thes. Cap. **2**: 39. *pl. 119*. 1863.—Wood, Natal Plants **6**: *pl. 534*. 1912.

Stems coarse, often 'with purple spots'. Flowers 2.5–4 mm. long, subsessile, in few-flowered cymules arranged in paniculate spikes. Calyx cupulate, about enclosing the corolla tube, lobes ovate-orbicular, deeply divided. Corolla lobes ovate, obtuse, nearly as long as the short-cylindrical tube, erect to spreading. Anthers oval, sessile, or subsessile, at the sinus. Scales triangular, and nearly reaching the stamens, or shorter and truncated, shallowly and irregularly denticulated, bridged at various heights. Ovary globose-conic, styles united, often subulate, of various lengths, but mostly about equal to the young ovary, stigmas small, flat, commonly spreading. Capsule 5–8 mm. long, globose-ovate, definitely circumscissile, carrying the withered corolla at the top; seeds about 3 mm. long, hilum long, narrow, terminal.

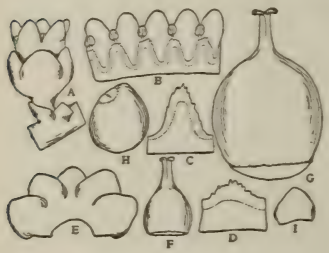

Fig. 123. C. cassytoides.

South Africa.

Specimens examined.—South Africa: (*Zeyher & Ecklon 2.7*); Hangklipp (*Mund & Maire 11*); Primitive forests of Uitehage (*Drege 8037*, the type, a specimen in the herbarium of the Missouri Botanical Garden); Johanistown (*MacOwan 371*); Grahamstown (*Schlechter 2755*); Mont Boschberg, Somerset (*Burchell 3178; MacOwan 1959*); Berea (*Wood V/92*); Kreilis country (*Bowker 492*); Kentani District (*Pegler 494*).

124. **Cuscuta timorensis** Decaisne

Cuscuta timorensis Decaisne, Mss., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 514. 1859.

Cuscuta reflexa Decaisne, in hb. Timor. descr. 66, ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 514. 1859. Not Roxburgh nor Wallich.

Stems coarse. Flowers 3–3.5 mm. long, on very short pedicels. Calyx cupulate, deep, lobes thick, fleshy, orbicular, concave, overlapping, edges more or

less uneven, well enclosing the corolla. Corolla campanulate, soon breaking loose and capping the developing capsule, lobes ovate, edges more or less irregular, obtuse, about equal to the tube. Stamens subsessile, oval anthers on short filaments at the sinuses. Scales represented only by winged ridges. Ovary ovate-conic, style shorter than the ovary, stigmas small, flattened-globose. Capsule conic, circumscissile, capped by the withered corolla; matured seeds not seen.

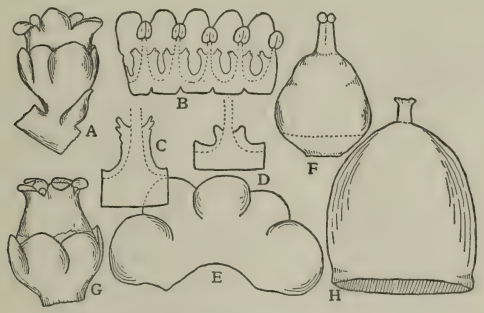

Fig. 124. C. timorensis.

I have examined Leschenault's specimen in the herbarium at Paris, which was also the one examined by Engelmann, but I am unable to understand his statement 'stigmas of the length of the style and scarcely thicker.' They seem to be much shorter than what I take to be the style. This species is very closely allied with *C. cassytoides*, and, indeed, it is almost impossible to distinguish some specimens included here from those representing that species. It may be that *C. timorensis* represents a more northern and eastern form of *C. cassytoides*. However, the scales in *C. timorensis* seem to differ in being more reduced: the filaments are slightly longer and the styles are shorter and with smaller stigmas, but there is considerable variation in these characters within the species. Further collections are necessary to clear up definitely this question of relationship. I am unable to distinguish between the Malayan forms of the species and those examined from Africa.

Malay Archipelago and central Africa.

Specimens examined.—Island of Timor (*Leschenault*, the type, in the herbarium of the Museum d'Histoire Naturelle at Paris); Malay Archipelago (*Riedel*).—JAVA: (*Backer 8276*).—AFRICA: Nyassa Hochland, alt. 1600–1800 meters (*Stolz 2153*); Usambara (*Holz 9062; Engler 767*); Tanganyiki district, Molala, alt. 5000 ft. (*Haaver* in 1925).

125. **Cuscuta japonica** Choisy

Cuscuta japonica Choisy, Systematisches Verzeichniss der im indischen Archipel in den Jahren 1842-1848 gesammelten H. Zollinger **1**: 134. 1854.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 517. 1859.—Lecomte, Fl. Gen. L'indo-Chine 312. *f. 37*. 1915.

Cuscuta systyla Maximowicz, Primitiae Florae Amurensis 200. 1859.

Cuscuta reflexa densiflora Bentham in herb., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 517. 1859.

Cuscuta japonica thyrsoidea Engelmann, Trans. Acad. Sci. St. Louis **1**: 517. 1859, in part.

Stems medium to coarse. Flowers 3–4 mm. long, subsessile, or mostly sessile, in elongated, thyrsoid cymes. Calyx short, mostly about reaching the middle of the corolla tube, lobes orbicular, or ovate, often thickish in the median part and infrequently carinate, but thin and membranous at the somewhat irregular edges, overlapping. Corolla lobes oval or ovate, erect or spreading, about half as long as the cylindrical tube, or more often shorter, edges irregular or crenulate. Anthers oval or oblong, sessile, or shortly stalked at the sinuses. Scales variable, oblong, ovate-triangular, or, rarely, reduced to ridges, bridged low, fimbriated. Style equal to, or mostly much longer than, the globose-ovoid ovary and the oval, or more or less subulate or globose stigmas. Capsule ovoid, carrying the withered corolla at the top, large, definitely circumscissile, leaving the dissepiment in the calyx; seeds about 3 mm. long, triangular-globose, hilum linear, terminal, transverse.

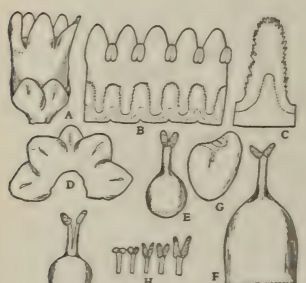

Fig. 125. A-H, C. japonica (H, different forms of stigmas); I, var. fissistyla.

In the eastern parts of Asia from Vladivostok and Amur to the Province of Yunnan, and in adjacent islands. On herbaceous and woody hosts.

Specimens examined.—Siberia: Lower Amur (*Maximowicz*); Prov. Amur (*Komarôv 1302; Chaffanjon* in 1896); Vladivostok (*Maximowicz* in 1860; *Topping 2402; 2450*).—Korea: (*Taquet 1157; 290*); Seoul (*Faurie 781*).—Japan: (*Zollinger 355*, taken to represent the type, a specimen in the Delessert herbarium; *Faurie* in 1902; *13543; Dickens* in 1877); Sapporo (*Arimoto* in 1903; *Tokubuchi* in 1887; *Faurie* in 1886); Mutsu, Asamushi (*hb. Buchtien 4511*); Tokio (*Matsumura* in 1879); Yokosuka (*Savatier 842*); Mombetsu (*Faurie 2038*); Aomori (*Faurie 1005; 1313*); Otaru (*Faurie 3111*); Tokushima (*Krug 1132*); Nagasaki (*Oldham 573*).—China: (*Maire* in 1912); Mt. Mukden (*Webster* in 1887); Chihli (*Meyer 1149*); Changli (*Clemens 6351*); Pekin (*l'Abbé David* in 1865); Chekiang (*Hu 405; Barchet 519*); Kwangtung, Hongkong and vicinity (*Hance 111*); central Shensi (*Licent 2960*); Yunnan (*Maire 6723B; 6725;*

Ducloux 514; 4914; Henry 9693); Kewkiang (*Shearer* in 1873); Nan-t'o and mts. to northward (*Henry 2632*); base of Eagle Rock, vicinity of Peitaiho (*Cowdry 413*); Su-tchuen (*Legendre*); Konan-po between Kien Tehonan and LiKiang (*Delavy 3655*).

Cuscuta japonica formosana (Hayata) n. comb.

Cuscuta formosana Hayata, Icones Plantarum Formosanarum **2**: 124. *pl. 30*. 1912.
Cuscuta japonica thyrsoidea, Engelmann, Trans. Acad. Sci. St. Louis **1**: 517. 1859, in part.

Flowers mostly 4–6 mm. long. Corolla cylindrical or trumpet-shape, lobes about half the length of the tube, or commonly shorter. Calyx scarcely reaching the middle of the corolla tube, mostly very short. Scales larger and more profusely fringed than in *C. japonica*, in some flowers scarcely reaching the middle of the tube but in others about reaching the stamens. Some specimens included here closely approach *C. japonica*.

Central and southern China and nearby islands.

Type.—'Akō, Tokubunsha' (*Kawakami* in 1910. Not seen).

Specimens examined.—China: (*Morse; Beauvais 233*); east of Pekin (*Serre 1389*); western China, Min Valley (*Wilson 4189*); Hupeh (*Henry 2475; 3185; Silvestri*); Shensi (*Giraldi 3278*); Hunan, Lichow (*Morse 176*); Prov. Kwangtung, Loh Fan Mt. (*Merrill 10247*); Hongkong (*Wilford;* hb. Hongkong *1961; Bodinier 939; Ford; Champion 457; Urquhart 271*); Hongkong and Canton (*Esquirol*); Yunnan (*Schneider 2349*); Mengtsze (*Hancock 354*); Kwangsi, Wuyuen (*Ching 8863*); Kewkiang (*Bullock 207*); Eshe-Kiang (*Poli*).

Cuscuta japonica paniculata Engelmann

Cuscuta japonica paniculata Engelmann, Trans. Acad. Sci. St. Louis **1**: 517. 1859.
Cuscuta colorans Maximowicz, Primitiae Florae Amurensis p. 201. 1859.

Flowers narrow, about 4 mm. long, on pedicels about 1 mm. long, in loose, paniculate inflorescences; calyx reaching the middle of the corolla tube, or shorter; style mostly slightly longer than the conic stigmas.

Specimens examined.—China: Pekin (*Kirilow*, the type, a specimen in the herbarium of the Missouri Botanical Garden). Known only from the type locality.

Cuscuta japonica fissistyla Engelmann

Cuscuta japonica fissistyla Engelmann, Trans. Acad. Sci. St. Louis **1**: 517. 1859.
Cuscuta Upcraftii Pearson, Bull. Roy. Bot. Gard. Kew **1**: 5. 1906.

Flowers about 3 mm. long, sessile; scales scarcely reaching the base of the anthers; styles united half to two-thirds their length, longer than the conic stigmas. In other respects this is the same as *C. japonica*. I can see no difference between the forms described by Engelmann and those described by Pearson as *C. Upcraftii*.

China.

Specimens examined.—China: Hongkong (*Wright 486*, the type, a specimen in

the herbarium of the Missouri Botanical Garden); Szechwan, between Tschienlu and Batang, 9000–14000 ft. (*Upcraft* in 1898, the type of *C. Upcraftii*, in the Kew herbarium).

126. **Cuscuta lupuliformis** Krocker

Cuscuta lupuliformis Krocker, Fl. Siles. **1**: 261. *pl. 36*. 1787.
Reichenbach & Reichenbach f. Icon. Fl. Germ. **18**: *pl. 1343. f. 1–7*. 1858.
Engelmann, Trans. Acad. Sci. St. Louis **1**: 516. 1859.—Flora Danicae **13**: *pl. 2224*. 1839.
?Aplostylis lupuliformis Rafinesque, Fl. Tellur. **4**: 91. 1836.

Stems coarse and not infrequently reddish. Flowers 3–4 mm. long, red-spotted in some specimens, sessile, or short pedicellate, in elongated, linear, spike-like clusters. Calyx deeply divided, lobes oval-ovate, obtuse, overlapping, reaching to about the middle of the corolla tube. Corolla cylindric, soon bulging in the basal region about the enlarging fruit, lobes nearly half as long as the tube, oblong-ovate, obtuse, erect, more or less crenulate. Anthers mostly sessile, attached below the sinuses, oblong to linear. Scales mostly bifid, or only represented by lateral wings, or, infrequently, entire. Ovary oval, more or less pointed into the style which when young is as long as the ovary, stigmas oval and distinct. Capsule ovoid, large, circumscissile with a regular and well defined line of cleavage and leaving the persistent dissepiment in the calyx, withered corolla at the top; seeds 2–3 mm. long, oval, rostrate, hilum linear, oblique.

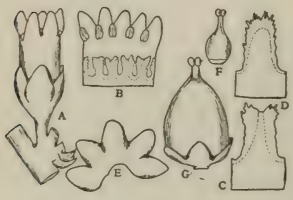

Fig. 126. C. lupuliformis.

Central and eastern Europe. Often on *Salix*.

Type from Silesia, Germany. Not seen.

Specimens examined.—Germany: Frankfort (without data); Lenzen (*Schütz*); Potsdam (*Wüst* in 1904); Tilsit (*Heidenreich*); Breslau (without data).—Hungaria: (*DeDegen* in 1898; *Kovats 203; Hahnald 639*); Budapest (without data); Garamkovácsi (*Moesz 393*); Kalocsa (*Wiesbauer* in 1876).—Russia: Minsk (*Paczoski* in 1892).

Cuscuta lupuliformis asiatica Engelmann

Cuscuta lupuliformis asiatica Engelmann, Trans. Acad. Sci. St. Louis **1**: 516. 1859.
Cuscuta flava Sievers, ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 516. 1859.
?Cuscuta Epithymum Sievers, ex Ledebour, Fl. Altaica **1**: 293. 1829.

Flowers mostly pedicellate; anthers on short filaments; scales mostly free with unevenly fringed margins (bifid and entire scales sometimes occur in the same flower).

Eastern Europe and in western Asia from Siberia to Bokhara and eastward to Chinese Turkestan. On herbaceous and woody hosts.

Specimens examined.—Russia: Volga River (*Fischer*, the type, a specimen in the herbarium of the Missouri Botanical Garden); River Angara (*Turczanioff* in 1833); 'Buchtarminsk' (*Karelin & Kariloff 926*); Prov. Kursk (*Pallon 1583*); Omsk (*Slowzow*); Semipalátinsk (*Schipczinsky 1299*); distr. Pawlodar (*Kutscherovskaja 860*); Central Asia, alt. 2200 meters (*Chaffanjon 1224*).—Chinese Turkestan: (*Merzbachter* in 1907); Sungaria (*Schrenk 229; 306b*).

127. Cuscuta gigantea Griffith

Cuscuta gigantea Griffith, Notulae ad plantas asiaticas 1: 243. 1847.—Engelmann, Trans. Acad. Sci. St. Louis 1: 516. 1859.

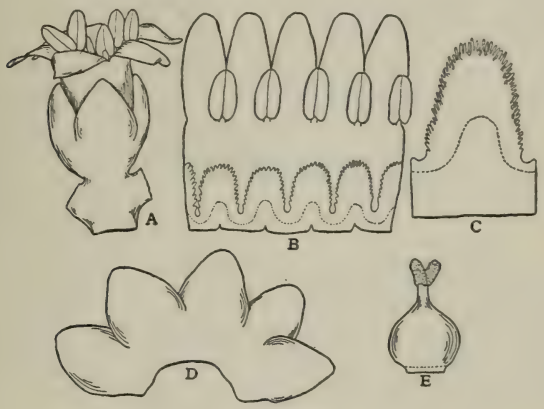

Fig. 127. C. gigantea.

Stems medium to coarse. Flowers 5–7 mm. long, short-pedicellate, in spike-like? clusters. Calyx about reaching the middle of the corolla tube, with the lobes rounded-ovate, obtuse, somewhat cristate, overlapping. Corolla lobes oblong, obtuse, reflexed, cristate, shorter than the cylindrical tube. Anthers sessile or subsessile, attached definitely below the sinuses. Scales ovate, fimbriated with numerous, short processes, about reaching the center of the tube. Ovary globose, style one, subulate, tapering into the ovary, stigmas about equal to, or shorter than, the style, flattened (ligulate). Capsule circumscissile. Matured seeds not seen.

Afghanistan. On *Tamarix*.

Specimens examined.—Afghanistan: Siah-sung ravine, alt. 10,300 ft. (*Griffith 1031* (*683*), the type, in the Kew herbarium); Topahee valley (hb. bot. gard. Sibpur).

Cuscuta gigantea Engelmanni (Korshinsky) n. comb.

Cuscuta Engelmanni, Korshinsky, Mém. Acad. Imp. Sci. St. Petersbourg VIII. **4**: 95. 1896.

Flowers about 5 mm. long. Scales profusely fimbriated and free. Styles much longer than the short stigmas. This form differs from *C. gigantea* principally in the much shorter stigmas, and proportionately shorter calyx. It much resembles *C. lupuliformis*, but with its profusely fimbriated scales and conic style it would appear to be more properly allied with *C. gigantea*.

Type.—'Hab. in decliviis argillosis jugi Alaici inter Gulcza et Langar distr. Osch copiose' (*Korshinsky?*, not seen).

Specimens examined.—Smarkand-Bokhara (*Fedtschenko 47*, the only specimen examined, which agrees in most particulars with Korshinsky's description, and is taken to represent his *C. Engelmanni*).

128. **Cuscuta monogyna** Vahl

Cuscuta monogyna Vahl, Symbolae Bot. etc. **2**: 32. 1791.—Sibthorp, Fl. Graeca **3**: *pl. 257*. 1819.—Krocker, Fl. Siles. **4**: suppl. *pl. 2*. 1823.—Mutel, Fl. Franç. *f. 284*. 1834.—Choisy, in DC. Prodr. **9**: 450. 1845.—Reichenbach & Reichenbach f., Icon. Fl. Germ. **18**: *pl. 1343, f. 2*. 1858.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 514. 1859.—Coste, Fl. France **2**: 573. *f. 2534*. 1903.

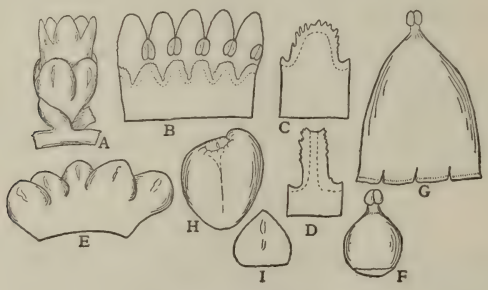

Fig. 128. C. monogyna.

Cuscuta orientalis Tournefort, Cor. Inst. Rei Herb. 45. 1703.

Cuscuta scandens, Brotero, Fl. Lusitan. **1**: 208. 1804, ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 514. 1859.

Cuscuta astyla Engelmann, Bot. Zeit. **4**: 276. 1846.

?Cuscuta monogyna iberica Koch, Linnaea **22**: 747. 1849.

Monogynella Vahliana DesMoulins, Études Org. .Cusc. 65.1853.

Monogynella Blancheana DesMoulins, in lit., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 515. 1859.

Cuscuta monogyna pauciflora Post, Fl. Syria, Palestine and Sinai 565. 1896.
?Cuscuta Merzbacheriana Palibine, ex Fedtschenko, Jour. Russe Bot. 63. 1914.
Cuscuta tian-shanica Palibine, Jour. Russe Bot. 27. 1915.

Stems medium to coarse. Flowers 3–4 mm. long, sessile or infrequently short-pedicellate, sometimes the fruit on pedicels as long as the capsule, in spike-like inflorescences of 1–4 flowered cymules, more or less fleshy. Calyx about enclosing the corolla, lobes orbicular-ovate, overlapping, obtuse, the edges uneven and medianally thickened. Corolla lobes oval-ovate, obtuse, crenulate, surface often granulate, upright, half to three-fourths as long as the short, cylindrical tube. Anthers sessile a little below the sinuses. Scales closely adnate with only a slight, dentate ridge free, bridged mostly at or somewhat below the middle, scarcely reaching the stamens, mostly truncated, or sometimes befid. Ovary globose-conic, short style about equal to the sub-globose or oval stigmas, or, infrequently, longer. Capsule ovate-conic or elongated-globose, circumscissile with a definite line of cleavage and leaving the dissepiment in the calyx, with the dried corolla capping it; seeds 3–3.5 mm. long, more or less rostrate, hilum oblong, transverse.

From France and northern Africa westward through Europe and central Asia to Sungaria, Afghanistan, and Persia. On a large number of different species of woody and herbaceous hosts, as *Rosa, Berberis, Rhamnus, Salix, Zizyphus, Pistacia, Paliurus, Chondrella, Vitis, Fraxinus, Citrus, Tamarix,* Leguminosæ, etc.

Type.—'Hab. in Oriente.' Not seen.

Specimens examined.—FRANCE: (*Gonnet; Requien; Bonneau* in 1875); Beaucaire (*Grenier* in 1850); Tarascon (*Maire* in 1835); Montpellier (*Bouchet; Godron; Delisle*).—GERMANY: Silesia (*Haussknecht* in 1867). GREECE (*Orphanides 281; Heldreich 3471*).—TURKEY: Amasia (*Bornmüller 1232; 2655; 4509*); Cappadocie, Kaisariye (*Balansa 297;* in 1856); Macedonia (*Bornmüller 1580*).—RUSSIA: Astrakhan, Sarepta (*Becker*). Caucasus (*Hohenacker; Koenig 292; Koenig & Woronow*).—BULGARIA: (*Schneider 629*).

AFRICA:—MOROCCO: (*Johandiez 937b*); Nemours (*Warnier* in 1869).

ASIA: GEORGIA: (*Hohenacker* in 1838).—SYRIA: (*Blanche 51; 1434; Haussknecht* in 1855; *Labillardière; Tournefort*); southern Syria (*Lowne* in 1863–64); Beirut (*Blanche 174*); Jordan (*Hooker & Hanbury* in 1860).—PALESTINE: Jericho (*Letourneux* in 1881; *Meyers & Dinsmore 5402*); Jaffa (*Meyers & Dinsmore 3522b*); Tiberias (*Meyers & Dinsmore 1402*).—PERSIA: (*Belander* in 1825; *Bornmüller 1240; Haussknecht 663;* in 1868; *Buhse* in 1847); Kermanshah (*Nöe 1032; Haussknecht*); Kuh-Daëna (*Kotschy 713*); between Meshet & Herat (*hb. Bungeanum* in 1858).—RUSSIA: Transcaspian Prov., Askhabad (*Sintenis 1240*); Prov. Samarkand (*v. Knorring & Minkwitz 1590*).—CHINESE TURKESTAN: Tien Shan (*Merzbacher* in 1908).—AFGHANISTAN: (*Griffith 682; 684*).

129. **Cuscuta Lehmanniana** Bunge

Cuscuta Lehmanniana Bunge in Alex. Lehmann, Reliquiae botanicae, in Mém. Sav. Étrang. St. Petersburg **7**: 396. 1851.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 515. 1859.

Stems medium to coarse. Flowers 4–6 mm. long, sessile or subsessile, on pedicels shorter than the flowers (not infrequently with the pedicel elongating in fruit), arranged in thyrsoid clusters, sometimes prettily tinted with pink. Calyx mostly about reaching the middle of the corolla tube, deeply divided, lobes broadly overlapping, ovate, obtuse, commonly with an uneven median carina which may end in an acute point at the tip of the lobe, edges unevenly crenulated. Corolla cylindrical or funnel-form, soon bulging in the basal part about the enlarging fruit, lobes about half to three-fourths as long as the tube, strongly crenulated, mostly ovate-orbicular, obtuse, upright to somewhat spreading, the surface of the lobes, and less frequently the other parts of the corolla, granulated by projecting cells. Anthers oblong, sessile definitely below the sinuses. Scales closely adherent with only a narrow, but abundantly fringed, edge free, which usually covers the base of the anthers, bridged at about the middle. Ovary globose or somewhat conic, with oval, somewhat elongated stigmas, the style mostly not exceeding the ovary. Capsule globose-ovoid, circumscissile in a definite line, leaving the ovate dissepiment in the calyx, the withered corolla carried at the apex; seeds 3–4 mm. long, oblong or ovoid, rostrate, hilum linear, crooked, terminal, transverse.

Fig. 129. A-H, C. Lehmanniana; I-K, var. esquamata.

Samarkand, Bokhara, Russian and Chinese Turketan. Mostly on woody hosts.

Specimens examined.—Central Asia: Prov. Samarkand (*v. Knorring 104; Budogoski 817*); Dist. Perowsk (*v. Knorring & Minkwitz 334*); Bokhara, on the banks of the Jan-Darja (*Lehmann*, the type, a specimen in the herbarium of the Missouri Botanical Garden); Central Asia (*Lipsky*). Turkestan (*Fedtschenko 1;* in 1897; *Capus 967; 968;* in 1881); Farab (*Litwinow 1587*); Bokhara, steppes (*Jaccard* in 1897); Prov. Syr-Darja, Tashkent (*Vvedensky 153*); Transcaspian and Bokhara desert (*Adiassewich* in 1908). Chinese Turkestan (*Karolkoff & Krauss*).

Cuscuta Lehmanniana esquamata Engelmann

Cuscuta Lehmanniana esquamata Engelmann, Trans. Acad. Sci. St. Louis **1**: 515. 1859.

Flowers pedicellate; anthers small and oval; scales reduced to wings, or lacking; corolla lobes less granulated and with smaller stigmas than in *C. Lehmanniana.*

Persia.

Specimens examined.—PERSIA: Mont Sipyle, au-desseus de Magnesia, on *Pistacia* (*Balansa 411*, the type, a specimen in the herbarium of the Missouri Botanical Garden); between Nischapur and Mechhed (*hb. Bungeanum* in 1858).

Section CALLIANCHE

Cuscuta section *Callianche* Engelmann, Trans. Acad. Sci. St. Louis **1**: 518. 1859.

Stigmas conic or elongated-subulate, but always pointed, sessile or on a short, single style. Only one species included.

130. **Cuscuta reflexa** Roxburgh

Cuscuta reflexa Roxburgh, Plants of the Coast of Coromandel **2**: 3. *pl. 104.* 1798.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 273. 1841.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 518. 1859.—Curtis, Bot. Mag. **37**: *pl. 6566.* 1881.—Collett, Fl. Simelensis 340. *f. 107.* 1902.—Basu, Indian Med. Pl. pt. 3. *pl. 668A.* 1918. Not Decaisne.

Cuscuta verrucosa Sweet, British Flower Garden 1^2: *pl. 6.* 1823. Not Engelmann.

Cuscuta reflexa verrucosa Hooker, Exotic Flora **2**: *pl. 150.* 1825.

Cuscuta Hookeri Sweet, Hortus Brit. **2**: 290. 1826.

?Kadurias reflexa Rafinesque, Fl. Tellur. **4**: 91. 1836.

Cuscuta macrantha Don. Gen. Syst. Gard. and Bot. **4**: 305. 1837.

Cuscuta grandiflora Wallich, Cat. no. 1318. Not H.B.K.

Cuscuta megalantha Steudel, Nomenclator Bot. **1**: 456. 1840.

Cuscuta elatior Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 273. 1841.

Cuscuta reflexa grandiflora Engelmann, Trans. Acad. Sci. St. Louis **1**: 518. 1859.

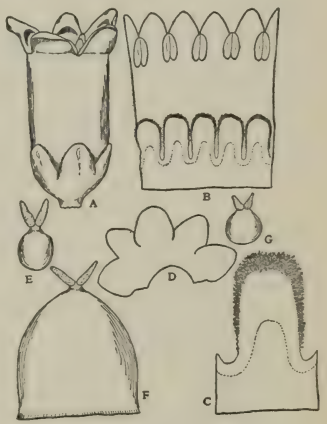

Fig. 130. A-F, C. reflexa; G, var. anguina.

Stems coarse. Flowers 5–10 mm. long (mostly about 6–8 mm.), sessile, or more commonly on pedicels which are shorter than the flowers, in loose, paniculate cymes, or sometimes in small cymules of one or two flowers. Calyx short, mostly not reaching the middle of the corolla tube, lobes rounded-ovate, deeply divided, obtuse, overlapping at the base, frequently irregular at the edge, sometimes more or less fleshy, verrucose or carinate. Corolla lobes oval-ovate, obtuse, upright, spreading or reflexed, much shorter than the cylindrical tube (usually one-fourth to one-third as long).

Anthers oval-oblong or linear, mostly on short filaments which are commonly attached just below the sinus. Scales scarcely, or about, reaching the middle of the tube, bridged below the middle, oblong or ovate, fimbriae abundant, fine, multicellular and branching. Ovary oval, pointed to form a single, short, thick style, stigmas conic to elongated (in some slightly flattened, ligulate), subulate, mostly longer than the style, divergent. Capsule globose-conic, 5–10 mm. long, often one-seeded, circumscissile with a well defined line of cleavage, carrying the withered corolla at the top, or soon falling off; seeds 3–3.5 mm. long, more or less rostrate, hilum a narrow, transverse, terminal line.

From Afghanistan and Baluchistan throughout northern India to Yunnan, China and in Java and Ceylon. On a great many different hosts, as *Lavatera, Doranta, Aguilegia, Fragaria, Nerium, Adhotoda, Viburnum, Parkinsonia, Coffea, Calotropis, Zizyphus, Apluda, Achyranthes, Peristrophe, Capparis, Melia, Carissa, Clerodendron, Cocculus, Thevetia, Citrus*, etc.

Type.—Not definitely known.

Specimens examined.—India: (*Jacquemont 1109; 2183; 2313; Wallich 1319*[2]; hb. *Wight 2320; Hooker*); Punjab, Mt. Tilla (*Stewart 734*); Sialkot (*Stewart 582*); Lahore (*Kashyap* in 1923; *Stewart 824; 824½*); Murree Hills (*Stewart 4119*); Kulan, Sind valley (*Stewart 3403*); Sikkim (*Clarke 25104; Hooker*); Nepal (*Wallich 1318*); Kashmir (*Stewart 7224½*); Kanowar (coll. ? in 1847); United Provinces, Allahabad (*Dudgeon* in 1923); Saharanpur (*Gamble 25677*); Dehra-Dun (*Gammie*); Himalayan region (*Hooker & Thomson; Edgeworth* in 1844); Khasia (*Hooker & Thomson*); Vale of Rocks (*Clarke 40354B; 45470*); Bengal (*R.L.H.* in 1893); Jessore (*Clarke 4156*); Suighbhum (*Clarke 34262D & F*); Ganges Plain (*Thomson*); Kumaon (*Strachney & Winterbottom 1*).—Afghanistan: (*Griffith*).—China: (*Maire* in 1912); Yunnan (*Henry 12738; Forrest 2980*).—Java: (*Backer 8344; 25298; Zollinger 2839; Koorders 37381B*).—Ceylon: (*Thomson* in 1845; *Gardner* 616).

Cuscuta reflexa anguina (Edgeworth) n. comb.

Cuscuta anguina Edgeworth, Trans. Linn. Soc. London **20**: 87. 1851.

Cuscuta reflexa brachystigma Engelmann, Trans. Acad. Sci. St. Louis **1**: 519. 1859.

Cuscuta reflexa Wallich, Cat. in part.—Edgeworth in Linn. Trans., Choisy, in DC. Prodr., and most authors. Not Roxburgh, ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 519. 1859.

Cuscuta pentandra Heyne in hb. Petrop., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 519. 1859.

Flowers mostly smaller (about 6 mm. long), lobes of the corolla commonly one-third to one-half as long as the tube; anthers mostly shorter, and sessile at the sinuses; stigmas short, conic, closely sessile, and more or less erect. Some of the specimens listed here are intermediate between this and *C. reflexa.*

India, particularly in the eastern region, and western China. On *Urtica*, Rubiaceae, *Rosa, Indigofera, Plectranthus*, etc.

Specimens examined.—India: (*Hehne; Jacquemont 149; 2520; Wallich 1319*[1]); Himalaya, alt. 5–6000 ft. (*Edgeworth 450*); Western Himalaya (*Thomson;* hb. *Schlagint-*

weit in 1856); Black Mt. expedition, Sudal Pass (*Duthie 7533*); Bengal, Calcutta (*Gaudichaud 129*, the type of Engelmann's var. *brachystigma*, a specimen in the herbarium of the Missouri Botanical Garden); Sikkim (*Gammie 757*); Hyderabad (*Campbell 1834*); Kashmir (*Duthie 13527; Stewart 3407*); behind Dal Lake (*Stewart 3313*); Burma (*Mokim 997*).—CHINA: Tsang-chang? (*Delavy 3612*); Yunnan (*Forrest 3014*); Ta-li Fu (*Schneider 2886; Delavy 3521*); west of Ta-li Fu, Mekong water shed (*Rock 6593*).—MAURITIUS, Moka 'naturalized' (*Johnston* in 1887).

Subgenus **Cuscuta**

Cuscuta Bauhin, Pinax 219. 1671.—Linnaeus, Sp. Pl. 124. 1753.—Pfeiffer, Bot. Zeit. **3**: 673. 1845.
Schrebera Linnaeus, Sp. Pl. 2d ed. 1662. 1763.
Cassytha (Gesner) ex S. F. Gray, Nat. Arr. Brit. Pl. **2**: 345. 1821.
Lepimes Rafinesque, Flora Tellur. **4**: 91. 1836.
Epilinella Pfeiffer, Bot. Zeit. **3**: 673. 1845.
Epithymum Opiz, Seznam 40. 1852.
Succuta Des Moulins, Études Org. Cusc. 74. 1853.
Cuscuta group *Cuscuta* proper Engelmann, Trans. Acad. Sci. St. Louis **1**: 459. 1859.
Subgenus *Succuta* Yuncker, Ill. Biol. Monogr. **6**: 111. 1921.

Styles mostly about equal, stigmas elongated, cylindrical (rarely clavate or short conic). Species belonging in this subgenus are all natives of the Old World. *C. Epithymum*, *C. Epilinum*, *C. europaea* and *C. approximata* have been introduced into North America. A few specimens of *C. Epithymum* have also been seen from South America.

KEY TO THE SECTIONS

Capsule not circumscissile.....CLEISTOCOCCA p. 261
Capsule irregularly circumscissile
Styles definite and slender.....PACHYSTIGMA p. 262
Styles lacking, or very short and thick.....EPISTIGMA p. 268
Capsule regularly circumscissile, styles and stigmas slender.....EUCUSCUTA p. 273

Section CLEISTOCOCCA

Section *Cleistococca* Engelmann, Trans. Acad. Sci. St. Louis **1**: 473. 1859.

Flowers sessile, in compact clusters; capsule remaining closed, closely invested by the corolla, breaking loose from the persistent calyx at maturity, styles short, subulate, stigmas pointed.

131. **Cuscuta capitata** Roxburgh

Cuscuta capitata Roxburgh, Hortus Bengal. 12. 1814; Flora Indica **1**: 468. 1820.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 473. 1859.
Cuscusta rosea Jacquemont in herb.
?Anthanema capitata Rafinesque, Fl. Tellur. **4**: 90. 1836.
Cuscuta pulchella altaica Engelmann, Trans. Acad. Sci. St. Louis **1**: 472. 1859.

Stems slender and often reddish. Flowers 3–4 mm. long, often red or rose colored, not infrequently 4-parted, subsessile, or on pedicels nearly as long as the flowers, in dense, umbellate-cymose clusters, papillate. Calyx about as long as the corolla tube, deeply divided, lobes ovate-lanceolate, acute to acuminate, not overlapping. Corolla cylindrical, soon becoming globular about the developing capsule, lobes upright or connivent, ovate to lanceolate, acute, shorter than the tube, so closely investing the fruit that it is difficult to remove the corolla entire, except in young flowers. Stamens shorter than the corolla lobes, filaments about equal to the small, oval anthers. Scales shorter than the tube, or nearly reaching the stamens, extremely thin, narrow, toothed, bifid, or dentate at the top, bridged low. Styles subulate and about equal to, or shorter than, the young ovary, stigmas elongated and about equal to, or shorter than, the styles. Capsule very thin, intrastylar opening relatively large, entirely surrounded and enclosed by the tough corolla, not circumscissile, but the capsule with the investing corolla very easily breaking away at maturity; seeds 3–4, about 1 mm. long, oval, hilum short, oblong, perpendicular or oblique.

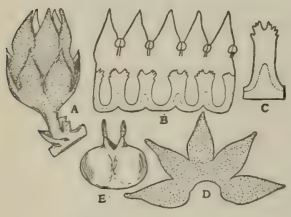

Fig. 131. C. capitata.

A well marked species with its papillate flowers and type of fruit. I cannot distinguish Engelmann's *C. pulchella altaica*, as represented by the Pallas specimen from Sarepta and the Sievers specimen from the Altai, from this.

Central Asia from Sarepta to the Altai and Himalayas, mostly at high altitudes. Hosts chiefly low herbs.

Type.—India (*Roxburgh.* Not seen).

Specimens examined.—ASTRAKHAN: Sarepta (*hb. Pallas*).—SAMARKAND: (*Bornmüller 275; 448; Komarov* in 1893).—AFGHANISTAN: (*Griffith*). On the Altai (*Sievers*).—INDIA: Himalaya region (*Jacquemont 1550*), Kunawar, alt. 7–10,000 ft. (*Thomson*); Kumaon (*Thomson; Strachney & Winterbottom 3*); Kashmir, alt. 12,000 ft. (*Clarke 29893A*).

Section PACHYSTIGMA

Perianth lobes acute or obtusish, scales prominent. Stigmas short-conic to cylindrical, shorter than, or about equaling the slender, or subulate styles. Capsules remaining closed, or opening by an irregular line of dehiscence.

KEY TO THE SUBSECTIONS

Capsules not circumscissile ..... CUCULLATAE p. 263
Capsules opening by an irregular line ..... AFRICANAE p. 263

Subsection Cucullatae

Capsule remaining closed. Styles subulate, stigmas short, conic, corolla lobes cucullate.

132. **Cuscuta cucullata** Yuncker

Cuscuta cucullata Yuncker, Candollea **3**: 318. 1928.

Stems slender to medium. Flowers about 2 mm. long, somewhat fleshy, glandular, on short pedicels, in loose clusters. Calyx about equaling the corolla tube, thickened at the basal part, lobes ovate, acute. Corolla lobes upright to somewhat spreading, triangular, acute, inflexed, with cucullate tips, longer than the campanulate tube. Stamens somewhat shorter than the corolla lobes, filaments slightly subulate and longer than the oval anthers. Scales oblong, truncated, fringed with short processes, reaching the stamens, bridged a little below the middle. Ovary globose, more or less depressed, on a short, thickened base, styles shorter than the ovary, divergent, subulate, stigmas conic and much shorter than the styles. Capsule depressed-globose, protruding from the withered corolla about its base, not circumscissile, styles widely divergent, intrastylar opening large. No well matured seeds seen.

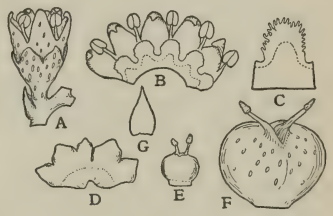

Fig. 132. C. cucullata.

This species differs from *C. appendiculata*, with which it is closely related, in its subulate, divergent styles, and conic stigmas.

Specimens examined.—Natal Colony, District Alexander, Station Dumisa, alt. 600 meters (*Rudatis 827*, the type, in the Delessert herbarium). Known only from the type locality.

Subsection Africanae

Capsules opening late and irregularly, stigmas short, clavate or cylindrical, calyx regular or angled at the sinuses. All South African species.

KEY TO THE SPECIES

Flowers about 2 mm. long, corolla lobes cucullate, stigmas short, clavate..... 133. *C. Gerrardii*

Flowers larger, not cucullate, stigmas longer
Calyx not especially angled
Calyx mostly shorter than the corolla tube
Style mostly much longer than the comparatively short stigmas..... 134. *C. africana*

Style about equaling the stigmas, and coarser.....135. *C. natalensis*
Calyx about enclosing the corolla tube.....136. *C. nitida*
Calyx strikingly angled at the sinuses.....137. *C. angulata*

133. **Cuscuta Gerrardii** Baker

Cuscuta Gerrardii Baker in Dyer, Flora Capensis 4²: 84. 1904.

Stems slender. Flowers about 2 mm. long, on short pedicels, more or less glandular, membranous. Calyx shorter than the corolla tube, or about as long, lobes ovate, obtuse, or acutish, slightly overlapping, loose about the corolla. Corolla lobes ovate, acute, tips cucullate, about equaling the campanulate tube, upright. Stamens shorter than the lobes, filaments about equaling the oval anthers. Scales ovate, about reaching the stamens, bridged below the middle. Styles slender and longer than the globose ovary, stigmas somewhat clavate, shorter than the styles. Capsules or seeds not seen. The ovary does not indicate whether the capsule would or would not be circumscissile.

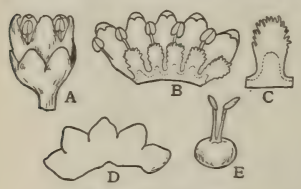

Fig. 133. C. Gerrardii.

This species is tentatively placed in this subsection because of its general resemblance to other species belonging here. Better specimens may show the capsule to remain closed which would place it in the subsection CUCULLATAE. This species also closely resembles *C. cucullata*, but differs with its more membranous flowers, longer and more slender styles and longer stigmas and, perhaps, circumscissile fruit.

Specimens examined.—SOUTHEASTERN AFRICA: Damp places, Zululand (*Gerrard 1337*, the type number, in the Kew herbarium). Known only from the type locality.

134. **Cuscuta africana** Thunberg

Cuscuta africana Thunberg, Flora Capensis 3: 568. 1813.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 272. 1841; also in DC. Prodr. **9**: 454. 1845, in part.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 475. 1859.

?Schrebera schinoides Linnaeus, Sp. Pl. 2d ed. 1662. 1763; f. in Nova Acta Reg. Soc. Sci. Upsal. **1**: pl. 5. *f. 1*. 1773.

Cuscuta americana Thunberg, Prodr. Pl. Capen. **1**: 32. 1794. Not Linnaeus.

?Nemepis africana Rafinesque, Fl. Tellur. **4**: 91. 1836.

Cuscuta capensis Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 271, *pl. 1, f. 4*. 1841.—Harvey, Thesaurus Capensis **1**: 29. *pl. 39*, 1859.

Cuscuta africana capensis Baker in Dyer, Fl. Capensis 4²: 85. 1904.

Cuscuta Keetii Schlechter mss. in hb. Albany Museum.

Cuscuta myricoides Druce in Bot. Exch. Club and Soc. British Isls. Rept. for 1913, **3**: 416. 1914.

Stems medium. Flowers mostly 3–4 mm. long, on pedicels longer or shorter than the flowers, in loose or sometimes compact clusters. Calyx shorter than the corolla tube, lobes triangular-ovate, obtusish. Corolla lobes mostly about equaling the campanulate-funnel-form tube, spreading to reflexed, acute or obtuse. Stamens shorter than the lobes, filaments longer than the oval anthers. Scales about reaching the stamens, sometimes exserted, bridged below the middle, oblong, fringed. Styles slender, longer than the globose ovary, and also longer than the thickened, oblong stigmas. Capsule globose, irregularly circumscissile, withered corolla carried towards the base of the capsule; seeds globose, hilum terminal, narrow, umbilical area irregular.

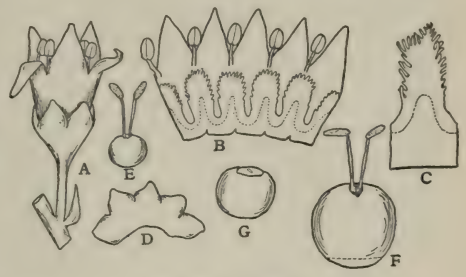

Fig. 134. C. africana.

There is considerable variation in the size of the flowers and proportion of its parts. This species is readily distinguished from *C. nitida* by its shorter calyx and longer styles, and from *C. natalensis* by its mostly longer styles, etc.

Engelmann believed that Linnaeus had this species in mind when he described and illustrated his *Schrebera schinoides*. Linnaeus' figure, while differing in several points, seems to agree better with this species than with any other south African form, and it is possible that it is the same as Thunberg's *C. africana*. There are no south African species represented in the Linnaean herbarium, however, nor does Linnaeus in his description, which also includes part of the host, show exactly which species he had in mind. The writer hesitates, therefore, to supplant Thunberg's well known and universally applied name with Linnaeus' somewhat doubtful one.

Cape region of South Africa. On woody hosts.

Type.—Not seen.

Specimens examined.—South Africa: Cape region (*Burchell 5730; Burman; Drege 7833; Zeyher 3447; Willdenow hb. 3161; Ecklon & Zeyher 22. 70. 10; Thom 508*); Knysna (*Keet 1009*); Georgetown (*Alexander* in 1847); Montagu Pass, Outeniqua Mts. (*Rehmann 218*); Langebergen, near Riversdale, alt. 2000 ft. (*Schlechter 1842*); Uitenhage div. (*MacOwan 1933; Drege*); Vanstaadesberg, alt. 1000 ft. (*Drege* in 1838); Humansdorp division, Kromme River (*Bolus 2406*).

135. **Cuscuta natalensis** Baker

Cuscuta natalensis Baker in Dyer, Flora Capensis 4^2: 85. 1904.

Stems medium. Flowers 4–7 mm. long, on pedicels shorter than the flowers, in cymose clusters. Calyx much shorter than the corolla tube, lobes triangular-ovate, acute, tips often spreading. Corolla lobes triangular-lanceolate, acute, half to about as long as the campanulate-cylindrical tube, upright to spreading or reflexed. Scales oblong, nearly reaching the stamens, or shorter, fringed with medium length processes, bridged below the middle. Stamens shorter than the lobes, filaments about equal to the oval or more or less sagittate anthers. Styles slender and about as long as the thickened stigmas, both together greater than the globose ovary. Capsule globose, late and irregularly breaking away at the base, intrastylar opening large, withered corolla surrounding or capping the capsule; seeds 1–1.25 mm. long, rounded, hilum a short line, oblique.

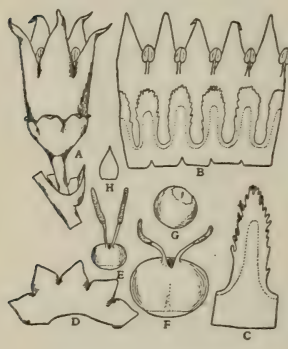

Fig. 135. C. natalensis.

This species differs from *C. nitida* in its more membranous flowers and in the shape and proportion of the perianth parts, and from *C. africana* in the proportion and length of style and stigmas which in this species are coarser, and also in the more lanceolate corolla lobes.

South Africa.

Specimens examined.—Natal (*Cooper 2790; 2791; 2785*); Inanda, on *Chrytia* (*Wood 596*, the type, a specimen in the Kew herbarium); Bothashile (*Wood* in 1891); dist. Alexandra, alt. 1100 meters (*Rudatis 1666*); Zululand, Ngyassa, on shrubs (*Wylie* in 1909); dist. Kentani, Fairview, alt. 2000 ft. among tall grasses and herbs (*Pegler 1508*).

136. **Cuscuta nitida** Meyer

Cuscuta nitida E. Meyer in herb., ex Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 272, *pl. 2. f. 1.* 1841. also in DC., Prodr. **9**: 454. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 474. 1859.

Cuscuta africana Ecklon & Zeyher in herb.

Cuscuta africana a Drege in herb.

Cuscuta Burmanni Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 273. 1841.

Stems medium. Flowers somewhat fleshy and granulate, especially young flowers, not infrequently reddish in color, 3–5 mm. long, on pedicels shorter than, or nearly equaling, the flowers, in loose, cymose clusters. Calyx deep,

lobes mostly short, triangular, acute, or in some flowers lanceolate and longer than the corolla tube. Corolla lobes spreading or reflexed, lanceolate, acute, equaling or exceeding the campanulate tube. Stamens about half as long as the corolla lobes, filaments longer than the oval anthers. Scales large, oblong, or, in old flowers, somewhat deltoid, reaching the stamens, fringed, bridged at, or below, the middle. Ovary globose, styles more or less divaricate and about equaling the oblong, thickened stigmas, both exceeding the ovary. Capsule circumscissile with a small basal opening, globose, with a depressed area about the base of the styles, carrying the withered corolla at the top, leaving the obcordate dissepiment in the calyx; seeds about 1.5 mm. long, hilum small, rounded or oblong.

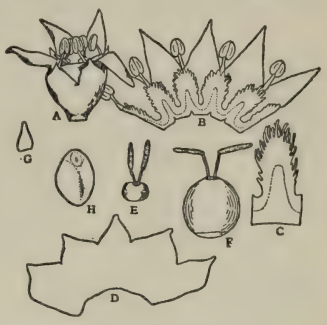

Fig. 136. C. nitida.

This species differs from *C. africana* in the acute calyx lobes which exceed the corolla tube, and in the shorter styles. Considerable variation in the length of styles and stigmas is found in the different specimens examined.

South Africa.

Specimens examined.—South Africa: (*Nereaux; Ecklon 341; 1010; Ecklon & Zeyher 1.11; 62.11; 21.1.11; 20.77.11; Drege* in 1835; in 1838; *Bolus 4427B; Zeyher 1235; Meyer; Schlechter 9047; 9093; 7271; Mund & Maire; Bowie; Burman*, the type? of *C. Burmanni;* a specimen grown in the Cambridge botanical garden on *Hermannia* from seed sent from south Africa by Prof. Pearson); Dry hillsides between Hex River and Kradouw Krantz, alt. 700 ft. (*Pearson 5248*); Port Natal (*Drege*); Miller's Point (*Wolley-Dod 859*); Piquetberg (*Stevens & Glover 8760*); Paarlberg, alt. 2000 ft. (*Drege*, taken as the type, in the DeCandolle herbarium); Lions Head, Cape Town (*Alexander; Burchell 291*).

137. **Cuscuta angulata** Engelmann

Cuscuta angulata Engelmann, Trans. Acad. Sci. St. Louis **1**: 474. 1859.
Cuscuta africana Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 272. 1841; also in DC. Prodr. **9**: 454. 1845, in part.
Cuscuta africana c Drege, in herb.
Cuscuta pentaptera Engelmann, in herb. Berol.
Cuscuta falkiiformis Schlechter, Bot. Jahrb. **24**: 449. 1897.

Stems slender. Flowers 3–4 mm. long, often glandular, on pedicels longer or shorter than the flowers, in loose fasciculate cymes, bracts ovate to mostly lanceolate, acute and numerous on the elongated pedicels. Calyx as long as the

corolla tube, lobes triangular, acute, angled at the sinuses by the protrusion of the calyx to form prominent wings. Corolla lobes triangular to lanceolate, edges sometimes irregular, upright to spreading, as long as, or exceeding, the campanulate, more or less angular tube which is commonly ridged opposite the corolla lobes to coincide with the calyx angles. Stamens shorter than the lobes, slender filaments longer than the oval, somewhat versatile anthers. Scales oblong or spatulate, bridged low, reaching the stamens, or exserted, fringed with moderate processes. Stigmas oblong and shorter than, or about equaling, the slender styles, both together exceeding the globose ovary. Capsule globose-pyriform, circumscissile, with the withered corolla about the top, intrastylar opening small; seeds solitary in the capsules examined, cordate, with a terminal hilum.

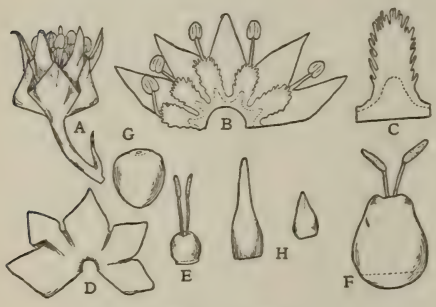

Fig. 137. C. angulata.

This very attractive species is easily recognized by its markedly angled calyx.

Cape region of South Africa.

Specimens examined.—South Africa: (*Roxburgh; Drege; Burchell 7792; Schlechter 9506; Mund & Maire*, labelled *C. pentaptera* Engelmann in hb. Berol.; *Bolus 8580*); Howhock, alt. 2500 ft. (*Schlechter 7381*, the type of *C. falkiiformis*, a specimen in the Boissier herbarium); Port Natal (*Drege*); Dutuitskloff, alt. 3000 ft., on *Staavia* (*Drege*, the type, a specimen in the herbarium of the Missouri Botanical Garden).

Section Epistigma

Cuscuta section *epistigma* Engelmann, Trans. Acad. Sci. St. Louis 1: 471. 1859.

Flowers sessile or mostly short-pedicellate, in compact, or loose, umbellate clusters. Styles essentially lacking, or represented by very short knobs; stigmas cylindrical or somewhat subulate; capsule late and irregularly circumscissile.

KEY TO THE SPECIES

Flowers about 4 mm. long

Calyx truncated, lobes scarcely evident, stigmas long.....138. *C. Haussknechtii*

Calyx not truncated, lobes definite, stigmas shorter.....139. *C. Kotschyana*

Flowers mostly 2–3 mm. long

Corolla lobes mostly shorter than the tube, flowers commonly 5-parted, reddish.... 140. *C. pulchella*

Corolla lobes mostly about equaling the tube, flowers commonly 4-parted, yellowish.....141. *C. pedicellata*

138. **Cuscuta Haussknechtii** n. sp.

Flores circ. 4 mm. longi, subsessiles, periantho 4 aut 5 fisso. Calyx altus, cupulatus, lobis non manifestis, truncatis. Corolla campanulata, lobis ovato-lanceolatis, longioribus quam tubus, acutis. Scalae oblongae aut spatulatae. Styli brevissimi, stigmata plerumque longior a quam ovarium globosum.

Stems medium. Flowers about 4 mm. long, subsessile, on short pedicels, in compact clusters?, somewhat fleshy, 4- or 5-parted. Calyx deep, cupulate, about enclosing the corolla, lobes scarcely distinguishable, truncated, represented only by very short projections. Corolla campanulate, lobes ovate-lanceolate, longer than the tube, spreading to reflexed, acute. Stamens shorter than the lobes, oval anthers on short filaments. Scales oblong or spatulate, bridged low, toothed about the truncated or rounded top, about reaching the stamens. Styles very short, stigmas mostly longer than the globose ovary. Capsules and seeds not seen.

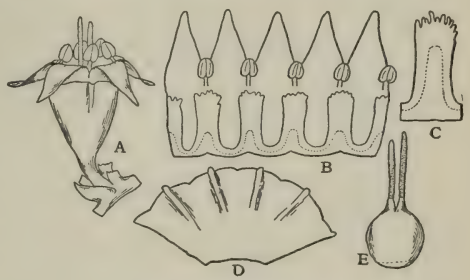

Fig. 138. C. Haussknechtii.

This species closely resembles *C. Kotschyana* in many particulars, but is separable on the basis of its strikingly truncated calyx and longer stigmas. Only a fragmentary specimen has been seen.

Specimens examined.—'Persica austro-occidentalis Kuh-nur et Sawers' (*Haussknecht* in 1868, the type, in the Boissier herbarium).

139. **Cuscuta Kotschyana** Boissier

Cuscuta Kotschyana Boissier, Diagn. Pl. Or. Nov. I. **7**: 29. 1846.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 471. 1859.

Cuscuta persica Decaisne in Engelmann, Trans. Acad. Sci. St. Louis **1**: 470. 1859.

Cuscuta Stapfiana Palibine, Jour. Russe Bot. 25. 1915.

Stems medium. Flowers 3.5–4 mm. long, on short pedicels, or sessile, in compact, glomerulate clusters, somewhat fleshy and often papillate. Calyx more or less loose about the corolla which it encloses, lobes short, broadly tri-

angular, acute, with a somewhat fleshy apex. Corolla lobes about equal to, or longer than, the campanulate tube, erect to spreading, ovate-lanceolate, acuminate, tips often papillate. Stamens shorter than the lobes, filaments about equal to the oval anthers. Scales oblong or ovate, reaching the stamens, often truncated, dentate or shallowly fimbriated at the top, bridged low. Ovary globose, styles lacking, or very short, stigmas cylindrical, or slightly tapering. Capsule circumscissile, carrying the withered corolla about it.

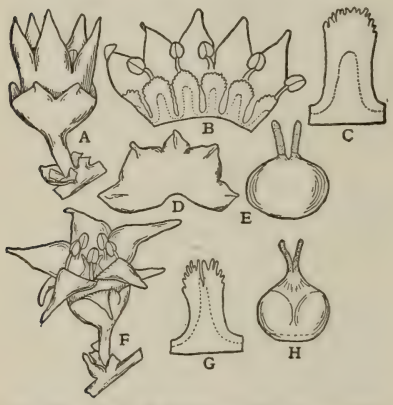

Fig. 139. A-E, C. Kotschyana; F-H, var. caudata.

I have examined Aucher-Eloy's specimen in the herbarium of the Museum d'Histoire Naturelle at Paris which represents Decaisne's *C. persica* and which is also the specimen seen by Engelmann and considered by him as distinct from *C. Kotschyana*. I am, however, unable to see how this specimen specifically differs from *C. Kotschyana*. In the young flowers the stigmas are white with no styles discernible, or represented only by very short knobs. In the mature fruit, however, the tips of some stigmas are brownish which may account for the fact that Engelmann considered Decaisne's *C. persica* as having longer styles.

Persia, Afghanistan, and Baluchistan.

Specimens examined.—PERSIA: Shiraz (*Stapf* in 1885); Ispahan (*Aucher-Eloy*, the type of *C. persica*, in the herbarium of the Museum d'Histoire Naturelle at Paris); southern Persia in m. Kuh-Däena (*Kotschy 749*, the type, a specimen in the Boissier herbarium); Khorasan, Nischapur (*hb. Bungeanum*); Montes Avroman & Schahu (*Haussknecht 661a*); between Kerman & Yezd (*hb. Bungeanum*).—AFGHANISTAN: Hari-rud Valley (*Aitchison 430*, taken to represent the type of *C. Stapfiana; 1089*).—BALUCHISTAN: west Himalayas, Gwal, alt. 5500 ft. (*Duthie* in 1883).

Cuscuta Kotschyana caudata Bornmüller & Schwarz

Cuscuta Kotschyana caudata Bornmüller & Schwarz, Repert. Spec. Nov. **26**: 57. *f. 3.* 1924.

Perianth lobes long, attenuated-caudate, ovary and fruit more conic-globose than in the typical form. Otherwise it seems very similar to *C. Kotschyana.*

Persia.

Type.—Persia, Sultanabad (*Strauss* in 1889. Not seen).

Specimens examined.—PERSIA: (*Pichler*); Mt. Schahu (*Haussknecht 661*).

140. Cuscuta pulchella Engelmann

Cuscuta pulchella Engelmann. Trans. Acad. Sci. St. Louis **1**: 472. 1859.

Cuscuta pulchella affghana Engelman, Trans. Acad. Sci. St. Louis **1**: 472. 1859.

Stems slender. Flowers 2.5–3 mm. long, on pedicels shorter or longer than the flowers, in umbellate-cymose clusters, fleshy and reddish. Calyx about reaching the corolla lobes, rather fleshy and thickened at the base, lobes triangular-ovate, acute, slightly overlapping at the base. Corolla lobes ovate acute, slightly papillate, erect, shorter than the campanulate-cylindrical tube. Stamens shorter than the lobes, oval, versatile anthers about equal to the filaments. Scales reaching the stamens, oblong, fringed about the top and more sparingly along the sides, bridged low. Ovary globose, styles lacking, stigmas elongated and cylindric. Matured fruit not seen.

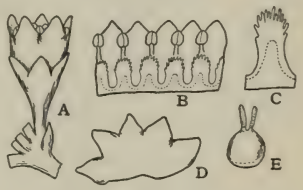

Fig. 140. C. pulchella.

A very pretty and well characterized species.

Afghanistan. On *Alhagi*, etc.

Specimens examined.—AFGHANISTAN: Topchee, in dry spots (*Griffith 690*, taken to represent the type, in the Kew herbarium; *691*).

141. Cuscuta pedicellata Ledebour

Cuscuta pedicellata Ledebour, Fl. Altaica **1**: 293. icon. *pl. 234*. 1829.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 269. 1841; also in DC. Prodr. **9**: 453. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 472. 1859.

Cuscuta arabica Fresenius, Beiträge zur Flora von Aegypten und Arabien, in Mus. Senckenb. **1**: 165. 1834.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 271. *pl. 1, f. 2*. 1841; also in DC. Prodr. **9**: 453. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 472. 1859.

Cuscuta Epithymum Bové, ex Choisy in DC. Prodr. **9**: 453. 1845.

Cassutha arabica DesMoulins, Études Org. Cusc. 72. 1853.

Grammica arabica DesMoulins, Bull. Soc. Bot. Fr. **1**: 298. 1854.

Cuscuta arabica aegyptiaca Engelmann, Trans. Acad. Sci. St. Louis **1**: 473. 1859.

Cuscuta lentis Stapf, Denkschr. Acad. Wien **1**: 21. 1885.

Cuscuta turcomanica Winkl in Radde, Transcaspien 144. 1890, nomen nudem.—Palibine, in Jour. Russe Bot. 27. 1915.

Cuscuta aegyptiaca Trabut, Bull. Soc. Bot. France **59**: 490. *pl. 12*. 1912.

Stems slender. Flowers 2–3 mm. long, rarely subsessile, commonly on pedicels equaling or sometimes exceeding the flowers, in umbellate glomerules of

3–8 flowers, mostly 4-parted, somewhat fleshy. Calyx somewhat rotate or cupulate, about reaching the lobes of the corolla, loose about the corolla, lobes triangular, acute or obtusish, not overlapping. Corolla globular-campanulate in young flowers, soon becoming the shape of the capsule which it closely invests, lobes connivent or upright to spreading, triangular-ovate, acute, about as long as the tube. Stamens shorter than, or about equaling, the corolla lobes, filaments subulate and longer than the oval-cordate to reniform anthers. Scales mostly oblong, about as long as the tube, or shorter, bridged low, thin, dentate about the truncated apex, or sometimes bifid or reduced (entire and bifid scales sometimes present in the same flower). Ovary globose-conic, styles represented by two, short, more or less flattened projections, stigmas slender, shorter than the ovary. Corolla closely investing and surrounding the globose-depressed capsule which breaks irregularly with a ragged edge at the thin base; seeds usually 4 in a capsule, about 1.25 mm. long, slightly oblique, hilum rounded or short-oblong, perpendicular.

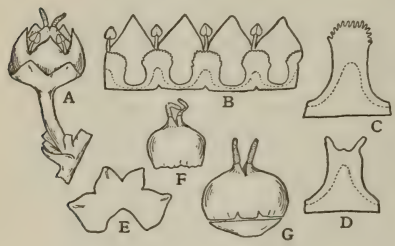

Fig. 141. C. pedicellata.

There is considerable variation in the size of the flowers and in the length of the pedicels. The scales are also variable with different forms sometimes occurring in the same flower. I am unable to distinguish specifically the species which I include here, nor do I believe, on the evidence shown in the specimens examined, that the variety *aegyptiaca* should be maintained as I find no constancy in the shape of the anthers or scales or in the length of the pedicels.

Egypt and Arabia to Persia, Armenia, and Central Asia. On various hosts, as *Galium, Artemisia, Trifolium, Trigonella, Eruca, Alhagi*, etc.

Specimens examined.—Egypt: (*Schweinfurth 107; 146; Kralik* in 1848; *Ascherson 537; Bové 354; Lippi; Aucher-Eloy 1418; Fischer* in 1836); Libyan desert (*Ascherson 353; 1070*); Memphis (*Letourneux* in 1887); Alexandria (*Ehrenberg; Letourneux 104*); Cairo (*Clarke 32053*).—Arabia: (*Schimper 140*).—Persia: (*Pichler*); Bandar Abbas (*Bornmüller 473*); Hamadan (*Pichler* in 1882, the type of *C. lentis*, a specimen in the Kew herbarium).—Armenia: (*Koch* in 1837); Mt. Ararat (*hb. Cosson 346*).—Syria: Ain Sultan (*Miss Osborn 257*).—Turkestan: (*Radde* in 1886, taken to represent *C. turcomanica*).—Central Asia: Samarkand, near Artscha-Maidan (*Fedtschenko 57*); Aschabad (*Sintenis 329*); Altai (*Ledebour*, the type, a specimen in the herbarium of the Missouri Botanical Garden).

Section Eucuscuta

Cuscuta group *Cuscuta*, section *Eucuscuta* Engelmann, Trans. Acad. Sci. St. Louis **1**: 460. 1859.

Flowers mostly sessile (pedicellate in first subsection), in compact, glomerulate clusters, membranous or fleshy; capsule circumscissile, styles mostly slender with elongated, slender, terete stigmas. Typically of the Old World.

KEY TO THE SUBSECTIONS

Flowers pedicellate, calyx truncated and with the lobes scarcely evident..... Babylonicae p. 273

Flowers mostly sessile, calyx not truncated and with definite lobes

Flowers mostly more membranous than fleshy; styles short, flowers commonly 4-parted (5-parted in *C. Epilinum*).....Europaeae p. 274

Flowers membranous or fleshy, often turgid; styles shorter or longer than the ovary, flowers commonly 5-parted.....Planiflorae p. 280

Subsection Babylonicae

Flowers 5-parted, pedicellate, calyx truncated, lobes scarcely evident: corolla lobes obtuse; styles and stigmas about equaling, or exceeding, the ovary.

142. **Cuscuta babylonica** Aucher

Cuscutata babylonica Aucher Mss. ex Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 270. *pl. 1, f. 1.* 1841; also in DC. Prodr. **9**: 453. 1845.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 461. 1859.

Cuscuta pedunculariis Kotschy in herb.

Cuscuta Viticis Handel-Mazzetti, Ann. K. K. Naturhist. Hofmus. **27**: 394. *pl. 18. f. 4a.* 1913.

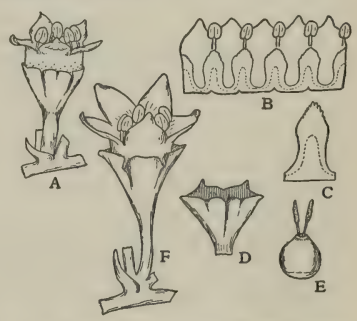

Fig. 142. A-E, C. babylonica; F, var. elegans.

Stems slender to medium. Flower about 3 mm. long, in few- to many-flowered, scattered, loose, cymose-umbellate clusters, smooth or papillate, on pedicels mostly as long as the 5-parted flowers. Calyx shorter than the corolla tube, truncated, with the lobes about lacking, represented only by short projections. Corolla lobes spreading, rounded-ovate, shorter than the campanulate tube, obtuse or acutish, overlapping at the base, sometimes slightly bulging over the calyx. Stamens nearly equaling the corolla lobes, filaments shorter than, or about equaling the large, versatile, oval anthers. Scales bridged very low, reaching the stamens, broader towards the triangular, or rounded top, en-

tire, or shallowly dentate about the top. Stigmas and styles about equaling the globose ovary, stigmas about equal to the styles, cylindrical. Capsule globose, thin, breaking away irregularly toward the base, 1–4 seeded, withered corolla about it; seeds .8–1.25 mm. long, verrucose, globose or compressed-globose, slightly rostrate, hilum short, oval.

Kurdistan, Mesopotamia and Persia.

Specimens examined.—On the Tigris (*Nöe 7; 906*); Bagdad (*Aucher-Eloy 1420*, the type, a specimen in the De Candolle herbarium; *3183*); KURDISTAN: (*Kotschy 388a; Haussknecht* in 1867); Inter Erbil & Riwandous (*Bornmüller 1536; 1538*); Mardin (*Sintenis 1109*).—MESOPOTAMIA: (*Haussknecht 659*).—PERSIA: Prov. Faristan, Niris, ad Arcem (*Bornmüller 4959*); ad fluvium Pulwar (*Bornmüller 4958*).

Cuscuta babylonica elegans Engelmann

Cuscuta babylonica elegans Engelmann, Trans. Acad. Sci. St. Louis **1**: 461. 1859.
Cuscuta elegans Boissier & Balansa, Diagn. Pl. Or. Nov. II. 3[3]: 129. 1856.

Corolla lobes more elongated, often exceeding the length of the corolla tube, more papillate, and with the calyx more prominently angled and more nearly enclosing the corolla tube than in *C. babylonica*.

Asia Minor to Persia.

Specimens examined.—Mountain regions of the Taurus (*Balansa 708*, the type, in the Boissier herbarium).—PERSIA: (*Haussknecht* in 1868).

Subsection EUROPAEAE

Flowers sessile, commonly 4-parted (5-parted in *C. Epilinum*), mostly more membranous than fleshy; styles mostly shorter than the ovary.

KEY TO THE SPECIES

Calyx lobes obtuse
- Capsule globose-conic, scales mostly bifid.....143. *C. europaea*
- Capsule depressed-globose, scales mostly entire.....144. *C. madagascarensis*

Calyx lobes acute
- Flowers commonly 5-parted, host mostly *Linum*.....145. *C. Epilinum*
- Flowers commonly 4-parted, rarely, if ever, on *Linum*
  - Corolla lobes not cucullate, flowers 2–3 mm. long.....146. *C. kurdica*
  - Corolla lobes cucullate, flowers mostly 1.5–2 mm. long.....147. *C. palaestina*

143. **Cuscuta europaea** Linnaeus

Cuscuta europaea Linnaeus, Sp. Pl. 124. 1753.—Hooker, Flora Londinensis **4**: fasc. I, *pl. 47*. 1819.—Reichenbach, Iconogr. Bot. Pl. Crit. *pl. 497*. 1827.—Mutel, Fl. Franç. *f. 282*. 1834.—Schnizlein, Iconographia **2**: *pl. 144*. 1843–70.—DesMoulins, Études Org. Cusc. 43. 1853.—Reichenbach & Reichenbach f. Icon. Fl. Germ. & Helvet. **18**: *pl. 1342. f. 4*. 1858.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 468. 1859.—Berg, Charakteristik *pl. 38. f. 296*. 1861.—Bentham, Handbook Brit. Fl. **2**: 572. *f. 682*. 1865.—Cusin, Herb. Fl. Franç. **16**: *f. 16*. 1875.—Thomé, Fl. Deutschl. Osterr. u. Schweiz **4**: *pl. 479*. 1889.—Masclef, Atlas Pl. France *pl. 223*. 1893.—Fiori & Paoletti,

Icon. Fl. Ital. 337. *f. 2851.* 1902.—Warming, Frøplanterne (Spermatofyter) *f. 492, 493.* 1912.—Yuncker, Ill. Biol. Monogr. **6**: 53. *f. 5, 85, 144.* 1921.

Cuscuta major Bauhin, Pinax 219. 1671; also of Choisy, Gilibert and many other authors.

Cuscuta filiformis a Lamarack, Fl. Française, etc. **2**: 307. 1778.

Cuscuta Epithymum Thuillier, Fl. Env. Paris 43. 1790. Not Murray

Cuscuta tetrandra Moench, Method. Pl. Marburg 461. 1794.

Cuscuta vulgaris Persoon, Syn. Plant. **1**: 289. 1805.

Cuscuta urceolata Stokes, Bot. Materia Medica **1**: 238. 1812.

Cassytha major, S. F. Gray, Nat. Arr. Brit. Pl. **2**: 346. 1821.

Cuscuta tubulosa Presl, Deliciae Pragenses 215. 1822.

Cuscuta halophyta Fries, Novit. Fl. Suec. Mant. 1: 8. 1832.

Cuscuta Epicnidea Bernhardi, Thüringische Gartenzeitung no. 4, 18. 1844.

Cuscuta Epitriphyllum Bernhardi, Thüringische Gartenzeitung no. 4, 18. 1844.

Cuscuta schkuhriana Pfeiffer, Bot. Zeit. **3**: 673. 1845.

Cuscuta halophila ?Fries, Summa Veg. Scand. **1**: 191. 1846.

Cuscuta europaea nefrens Fries, Summa Veg. Scand. **1**: 191. 1846.

Cuscuta europaea pontica Koch, Linnaea **19**: 19. 1847.

Cuscuta segetum Rota, in Parlatore, Giorn. Bot. Ital. **2**: 286. 1847.

Cuscuta brachystyla Koch, Linnaea **22**: 747. 1849.

Cuscuta europaea halophyta Hartman, Handbook Skand. Fl. Ed. 5. 38. 1849.

Cuscuta europaea vacua Grenier & Godron, Fl. France **2**: 504. 1850.

Cuscuta capillaris Edgeworth, Trans. Linn. Soc. London **20**: 86. 1851. Not Wallich nor Reichenbach.

Cuscuta Ligustri Areschoug, Revisio Cuscutarum Sueciae 17. 1853.

Cuscuta europaea legitima Areschoug, Revisio Cuscutarum Sueciae 15. 1853.

Cuscuta europaea Epilotum Areschoug, Revisio Cuscutarum Sueciae 16. 1853.

Cuscuta europaea Epilobii Areschoug, Revisio Cuscutarum Sueciae 16. 1853.

Cuscuta Viciae Schultz, ex DesMoulins Études Org. Cusc. 77. 1853.

Cuscuta hyalina Boissier in sched. Not Roth nor Wight.

Cuscuta tetrasperma Jan in herb.

Cuscuta monogyna Schmidt, Fl. Bohem., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 469. 1859. Not Vahl.

Cuscuta europaea Viciae, Engelmann, Trans. Acad. Sci. St. Louis **1**: 469. 1859.

Cuscuta Solani Holuby, Oesterr. Bot. Zeitschr. **24**: 304. 1874.

Cuscuta europaea schugnanica Fedtschenko, Trav. Mus. Bot. Acad. Imp. Sci. St. Pet. **1**: 152. 1902.

Cuscuta major typica Rouy, Fl. France **10**: 355. 1908.

Cuscuta major ambigens Rouy, Fl. France **10**: 356. 1908.

Stems medium. Flowers 2–3 mm. long, on short, thickish pedicels, in globular, compact clusters, mostly 4-parted. Calyx lobes ovate, obtuse, shorter than the corolla tube, or about equaling it. Corolla campanulate, becoming urceolate as the fruit develops, lobes upright to spreading, triangular or ovate, obtuse, or sometimes acutish. Scales small, thin, mostly shorter than the tube, or about reaching the stamens, commonly bifid, but sometimes entire, mostly

sparingly fringed towards the top, bridged mostly about a third of their height. Stamens shorter than the lobes, filaments somewhat subulate, about equal to the oval or roundish, slightly versatile anthers. Styles shorter than the globose, slightly pointed ovary, stigmas filiform, as long as or shorter than the styles, styles and stigmas together shorter than the ovary. Capsule globose-conic, capped by the withered corolla, circumscissile with a definite line of cleavage; seeds about 1.5 mm. long, usually four in a capsule, oval compressed, slightly angled, hilum oblong, transverse.

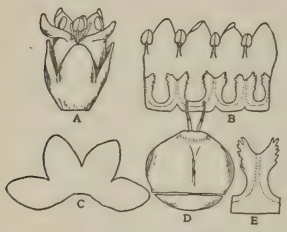

Fig. 143. C. europaea.

The size of the flowers, the shape and size of the scales and the shape of the capsules are quite variable in this species which, however, is ordinarily easily recognized. The scales were always found to be present in the large number of specimens examined and are not uncommonly bifid and entire in the same flower. Varieties based on scale characters are difficult, if not impossible, to maintain.

Throughout Europe to northern Africa and western Asia. Casual in North America. This species will grow on practically any host within reach, but seems to prefer herbs.

Type.—The prototype of Bauhin probably from Switzerland. Unknown.

Cuscuta europaea indica Engelmann

Cuscuta europaea indica Engelmann, Trans. Acad. Sci. St. Louis **1**: 469. 1859.

Flowers about 2 mm. long, mostly 5-parted, sessile, perianth lobes often acutish; scales about reaching the stamens, bifid or entire.

Mostly from northern India and neighboring regions.
Type.—From India?. Not known.

Cuscuta europaea conocarpa Engelmann

Cuscuta europaea conocarpa Engelmann, Trans. Acad. Sci. St. Louis **1**: 469. 1859.

Similar to *C. europaea*, with which it intergrades, differing, however, in having a markedly conic or pyriform capsule.

The distribution of this form is similar to that of *C. europaea.*
Type.—Not indicated by Engelmann.

144. Cuscuta madagascarensis n. sp.

Flores membranacei, periantho 4 aut 5 fisso, 3 mm. longi, sessiles. Calycis lobi ovati, obtusi aut aliquantum acuti. Corolla campanulata, lobis ovatis, ob-

tusis, circ. aequis corollae tubo. Antherae ovatae, filamenta aliq. crassa. Scalae ovatae, indentatae aut leviter bifidae aut dentatae. Styli stigmata aequantes. Capsula depresso-globosa, circumscissilis.

Stems medium. Flowers membranous, 4- or 5-parted, about 3 mm. long, sessile in compact, few-flowered glomerules. Calyx loosely enveloping the corolla, lobes ovate, obtuse or acutish, slightly fleshy at the tips, edges often revolute, not overlapping. Corolla thin, membranous, campanulate, lobes erect, ovate, obtuse, about equaling the corolla tube. Stamens shorter than the lobes, filaments stoutish, more or less subulate, longer than the ovate anthers. Scales ovate, definite, entire or slightly bifid, toothed about the top, bridged at or slightly below the middle, reaching the stamens. Styles and stigmas about equal, together about equaling or longer than the globose ovary. Capsule depressed-globose, circumscissile, enclosed by the withered corolla; seeds ovate, hilum short, oblong.

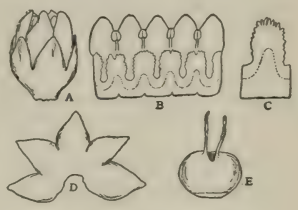

Fig. 144. C. madagascarensis.

This species closely resembles *C. europaea* in most characters, but differs in the scale characters, in its depressed capsule, and in the length of the styles and stigmas.

Specimens examined.—Central Madagascar (*Baron 3466*, the type, in the Kew herbarium).

Cuscuta madagascarensis Schlechteri n. var.

Corollae lobi circ. dimidium longi quam corollae tubus. Scalae oblongae.

Corolla lobes about half as long as the corolla tube; scales oblong, bridged low, styles shorter and stouter? than in *C. madagascarensis*.

Specimens examined.—South Africa: Hilton Road, alt. 3700 ft. (*Schlechter 6761*, the type, in the herbarium of the Botanical Institute at Dahlem).

145. **Cuscuta Epilinum** Weihe

Cuscuta Epilinum Weihe, Archiv des Apothekervereins im nördlichen Deutschland **8**: 50, 51. 1824.—Reichenbach, Icon. Bot. Pl. Crit. *f. 500.* 1827.—Flora Danicae **12**: *pl. 1987.* 1834.—Mutel, Fl. Franç. *f. 285.* 1834.—Choisy, Mém. Soc. Phys. Hist. Nat. Genève **9**: 268. 1841; also in DC. Prodr. **9**: 452. 1845.—Cosson & Germain, Atlas Fl. Env. Paris *pl. 14, f. B.* 1845.—Reichenbach & Reichenbach f. Icones Fl. Germ. & Helvet. **18**: *pl. 1342, f. 3.* 1858.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 470. 1859.—Bentham, Handb. Brit. Fl. **2**: 572. *f. 683.* 1865.—Syme, Eng. Bot. 3d ed. **6**: *pl. 926.* 1866.—Cusin, Fl. Franç. **16**: *f. 15.* 1875.—Matthew, Bull. Torrey Club **20**: *pl. 164. f. 1.* 1893.—Coste, Fl. France **2**: 574. *f. 2537.* 1903.—Britton & Brown, Illust. Flora **3**: 28. *f. 2957.* 1898; 2d ed. **3**: 48. *f. 3442.* 1913.—Fiori & Pao-

letti, Icon. Fl. Ital. 337. *pl. 2852.* 1902.—Howard, Agr. Res. Inst. Pusa Bull. **11:** 4. *pl. 1.* 1908.—Yuncker, Ill. Biol. Monogr. **6:** 114. *f. 3, 59, 133.* 1921; Proc. Ind. Acad. Sci. **1919:** 163. *f. 6.* 1921.

Cuscuta major Koch & Ziz, Cat. Pl. Palat. 5. 1814. Not Bauhin.

?Cuscuta aggregata Roxburgh, Hortus Bengal. 12. 1814; Flora Indica **1:** 467. 1820.

Cuscuta vulgaris Presl, Flora čechica 56. 1819. Not Persoon.

?Cuscuta europaea tenuior Wahlenberg, Fl. Upsal. 55. 1820.

Cuscuta densiflora Soyer-Willemet, in Mém. Soc. Linn. Paris **1:** 26. 1822 nomen; **4:** 281. 1826. Not Hooker.

Epilinella cuscutoides Pfeiffer, Bot. Zeit. **3:** 673. 1845.

Cuscuta linodesmon Gesner, ex DesMoulins, Études Org. Cusc. 64. 1853.

Stems slender to medium. Flowers about 3 mm. long, sessile, in scattered, compact glomerules. Calyx as long as the corolla and somewhat loose about it, lobes broadly ovate, acute. Corolla urceolate, early conforming to the shape of the capsule, lobes ovate-triangular, obtusish or acute, shorter than the tube. Scales shorter than the tube, spatulate, truncated, bifid or entire, sometimes reduced to short wings near the base of the corolla, thin, bridged below the middle. Stamens shorter than the corolla lobes, anthers ovate, about as long as the somewhat subulate filaments. Ovary depressed-globose, styles shorter than, or nearly equaling, the thickish stigmas. Capsule depressed-globose, somewhat angled about the developing seeds, circumscissile, leaving the obcordate dissepiment in the calyx, carrying the withered corolla at the top; seeds about 1.2 mm. long round or ovate to oval, angular, somewhat scurfy, hilum linear, oblong, transverse or oblique.

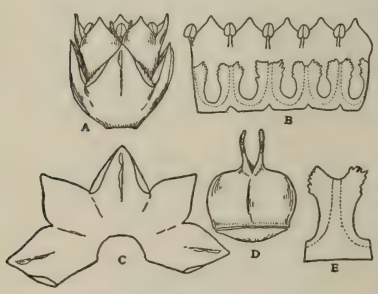

Fig. 145. C. Epilinum.

Common in the flax fields of Europe, from whence it has been scattered throughout the world with the seeds of its host. It prefers *Linum* as a host and is rarely found on other plants.

Type.—Probably from near Minden, in western Germany.

146. **Cuscuta kurdica** Engelmann

Cuscuta kurdica Engelmann, Trans. Acad. Sci. St. Louis **1:** 470. 1859.

Cuscuta alpina Hohenacker in herb.

Stems slender. Flowers 2–3 mm. long, sessile, in small, dense glomerules, membranous, mostly 4-parted, usually at least one 5-parted flower in each

glomerule. Calyx about enclosing the corolla tube, lobes ovate-lancoelate, acute. Corolla soon becoming globose about the quickly developing capsule, lobes broadly ovate, acute, connivent over the ovary and fruit, or upright, about as long as the tube. Stamens shorter than the corolla lobes, ovate, anthers about equal to the filaments. Scales thin, reaching the filaments, or mostly shorter, oblong, often bifid, bridged low, sparingly fringed about the top. Filiform stigmas about equaling the very short and slender styles, much shorter than the globose ovary. Capsule globose-depressed, circumscissile, withered corolla surrounding and capping the capsule; seeds ovate, mostly four in each capsule, about 1.25 mm. long, hilum short, oblong.

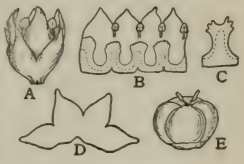

Fig. 146. C. kurdica.

This species closely resembles *C. europaea* from which it is to be distinguished by its acute perianth lobes. It differs from *C. palaestina* by its larger flowers, short styles, and with non-cucullate corolla lobes.

Kurdistan.

Specimens examined.—KURDISTAN: (*Brant*); on the Gara Mts. (*Kotschy 388b*, the type, a specimen in the herbarium of the Missouri Botanical Garden); montes Avroman et Schahu, alt. 12000 ft. (*Haussknecht 662a*); 'Prov. Musch, in dst. Warto' (*Kotschy 289*).

147. **Cuscuta palaestina** Boissier

Cuscuta palaestina Boissier, Diagn. Pl. Or. Nov. I. 2[11]: 86. 1849.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 467. 1859.

Cuscuta cretica Tournefort, Coroll. Inst. Rei Herb. 45. 1703.

Cuscuta capillaris Reichenbach, Icon. Bot. **5**: 64. 1827. Not Edgeworth nor Wallich.

Cuscuta micrantha Tineo, in Gussone, Fl. Siculae Syn. **2**: 887. 1844. Not Choisy nor Martius.

Cuscuta globularis Bertoloni, Fl. Ital. **7**: 625. 1847.

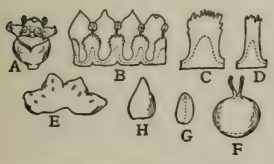

Fig. 147. C. palaestina.

Stems very slender. Flowers 1.5–2 mm. long, more or less fleshy and glandular, mostly 4-parted, sessile, in small, few-flowered, compact glomerules. Calyx about enclosing the corolla, lobes broadly ovate, acute, thickened and somewhat carinate. Corolla lobes about as long as the cylindrical tube, acute, mostly spreading, with cucullate tips. Stamens shorter than the lobes, anthers oval, more or less sagittate, about equalling the filaments, connective often apiculated. Scales reaching the filaments, or shorter, mostly oblong, fringed with moderate processes about the top, bridged low, sometimes bifid. Styles mostly about equaling, or exceeding, the globose ovary, stigmas cylin-

dric and about equaling the styles. Capsule globose, somewhat depressed, circumscissile, mostly 4-seeded, invested by the withered corolla; seeds oval, about 1 mm. long, hilum small.

This is one of the smallest of the European species. It is to be distinguished by its slender stems, small clusters of very small, mostly 4-parted flowers, and cucullate corolla lobes. Some of the specimens cited below intergrade with variety *syriana*.

Chiefly in the eastern Mediterranean region. On *Thymus*, *Helianthus*, *Euphorbia*, *Poterium*, etc.

Specimens examined.—PALESTINE: (*Boissier* in 1846, taken to represent the type, in the Boissier herbarium).—SYRIA: (*Peyron* in 1886; *Barbey* in 1880); Saida (*Blanche 707*).—ARABIA: (*Botta*).—PERSIA: (*Haussknecht* in 1868).—EGYPT: (*Schweinfurth* in 1887).—TRIPOLI: (*Krause 569*).—TUNIS: (*Letourneux* in 1884).—CRETE: (*Gandoger 7215; 12040; Raulin 323; Baldacci 188; Sieber* in 1821).—CYPRUS: (*Orphanides 2869; Sintenis & Rigo 61;* in 1880).—KARPATHOS: (*Pichler* in 1883).—MALTA: (*Duthie* in 1874).—GREECE: (*Baldacci 28; Heldreich* in 1855; *Orphanides 2813*); Athens (*Heldreich 237; 2048;* in 1892; in 1877; *Haussknecht* in 1885); Patras (*Halácsy* in 1893). SICILY: (*Huet du Pavillon* in 1855; *Tineo* in 1847).—AUSTRIA: Istria-Parenzo (*Marchesetti* in 1900).

Cuscuta palaestina syriana n. var.

Calyx alte divisus, lobis acutis usque acuminatis. Flores membranacei.

Flowers mostly more membranous: calyx more deeply divided, lobes acute to acuminate, corolla lobes more pointed and not so cucullate as in *C. palaestina*.

Eastern Mediterranean region. On *Poterium spinosum*, etc.

Specimens examined.—PALESTINE (*Gaillardot*).—SYRIA, Beirut (*Blanche 172; Peyron 925* in part); Saida (*Blanche 196*, the type, in the Boissier herbarium); Damascus (*Kotschy 914*).

Subsection PLANIFLORAE

Flowers mostly sessile in compact glomerules, membranous, or often fleshy and turgid, commonly 5-parted; styles mostly equaling or exceeding the ovary. Most abundant in the Mediterranean region.

KEY TO THE SPECIES

Calyx lobes obtuse
- Flowers 3–4 mm. long, pedicellate ..... 148. *C. triumvirati*
- Flowers about 2 mm. long, sessile ..... 149. *C. obtusata*

Calyx lobes mostly acute, often fleshy and turgid
- Flowers mostly more membranous than fleshy
  - Calyx lobes oblong, much longer than the short tube ..... 150. *C. stenoloba*
  - Calyx lobes shorter ..... 151. *C. Epithymum*
- Flowers mostly more fleshy than membranous
  - Calyx fleshy, lobes not especially turgid at the tips
    - Flowers mostly smooth

Styles mostly longer than the ovary.....152. *C. abyssinica*
Styles mostly much shorter than ovary.....153. *C. brevistyla*
Flowers mostly more or less papillate
Flowers commonly reddish, stigmas cylindrical.....154. *C. Balansae*
Flowers whitish, stigmas awl-shaped, calyx more or less appendiculate.....
155. *C. somaliensis*
Calyx fleshy, lobes strikingly turgid at the tips in most specimens
Scales mostly bifid and shorter than the tube.....156. *C. Letourneuxii*
Scales mostly entire and reaching the stamens
Calyx deeply divided, flowers 2–3 mm. long.....157. *C. planiflora*
Calyx turbinate, not deeply divided, flowers longer....158. *C. approximata*

148. **Cuscuta triumvirati** Lange

Cuscuta triumvirati Lange, Kjoeb. Videnskab. Meddel. 98. 1882.
Cuscuta Epithymum obtusiflora Engelmann mss., ex Reichenbach & Reichenbach f. Fl. Germ. **18:** 86. *pl. 1343. f. 19–20d.* 1858.
Cuscuta Epithymum obtusata forma *macropoda* Engelmann, Trans. Acad. Sci. St. Louis **1:** 462. 1859.

Stems slender to medium. Flowers 3–4 mm. long, on pedicels nearly as long as, or about equaling the flowers, reddish. Calyx shorter than the corolla tube, lobes oval-ovate, obtuse, not overlapping at the base. Corolla lobes broadly oval-ovate, spreading, obtuse, about equal to the campanulate tube. Stamens shorter than the lobes, anthers oblong or oval, about equal to the somewhat subulate filaments. Scales ovate, not reaching the stamens, bridged below the middle, shallowly fringed about the top (Lange erroneously considered the scales as lacking). Styles and stigmas slender and longer than the globose-depressed ovary. Matured fruit not seen.

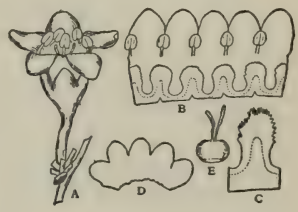

Fig. 148. C. triumvirati.

Spain and Morocco.

Specimens examined.—Spain: Regn. Granatense, Sierra Nevada ad Dornajo, alt. 2000 meters (*Huter, Porta & Rigo 372*, the type, a specimen in the herbarium of the Museum d'Histoire Naturelle at Paris); Regn. Granatense (*Porter & Rigo 544*); Sierra Nevada (*Pau 5991; Funk*, the type of *C. Epithymum obtusata* forma *macropoda*).—Morocco: Noyen Atlas, Aghbalon Sarbi (*Johandiez 852*).

149. **Cuscuta obtusata** (Engelmann) Trabut

Cuscuta obtusata (Engelmann) Trabut, Bull. Soc. Bot. France **53:** xxxviii. 1907.
Cuscuta epithymum obtusata forma *apoda* Engelmann, Trans. Acad. Sci. St. Louis **1:** 462. 1859.

Stems medium. Flowers about 2 mm. long, sessile, in few-flowered clusters. Calyx shorter than the corolla tube, lobes broadly ovate, obtuse, Corolla lobes

oval-ovate, obtuse, about equal to the campanulate tube. Stamens shorter than the lobes, oval anthers about equal to the filaments. Scales about reaching the stamens, oblong, shallowly fringed about the rounded top. Styles and stigmas slender and equaling, or exceeding, the globose ovary. Capsule globose, circumscissile; seeds small.

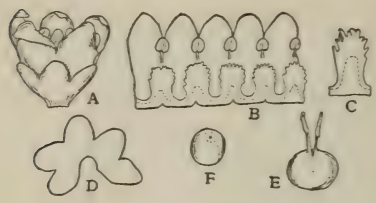

Fig. 149. C. obtusata.

This species differs from *C. Epithymum* in the shape and proportion of the calyx and corolla lobes.

Specimens examined.—Asia Minor: Koniah (*Heldreich* in 1845, the type, a specimen in the herbarium of the Missouri Botanical Garden); base de la Montagne de Msala (*Constantine*) on *Pedicularis* (*Cosson* in 1861).

150. **Cuscuta stenoloba** Bornmüller & Schwarz

Cuscuta stenoloba Bornmüller & Schwarz, Repert. Spec. Nov. **26**: 56. *f. 2.* 1924.

Stems slender. Flowers 3–5 mm. long, white or somewhat pinkish, sessile, in dense, compact glomerules. Calyx about as long as, or mostly exceeding, the corolla tube, lobes oblong-lanceolate, acutish, often more or less turgid. Corolla lobes oblong-lanceolate, acute, much longer than the short, campanulate tube, some tips cucullate. Stamens at, or slightly below the sinuses, oval anthers on rather long filaments. Scales ovate, or somewhat spatulate, fringed with moderate processes, bridged at, or below the middle, in some flowers small scales are present in the sinuses outside the stamens, or laterally attached to the filaments. Stigmas about the same length as, or longer than, the slender styles, both together longer than the globose or pyriform ovary, intrastylar openings large. In several flowers examined the two carpels had failed to mature, leaving an open, undeveloped ovary with the ovules exposed. Matured fruit not seen.

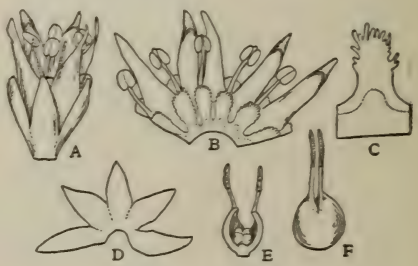

Fig. 150. C. stenoloba.

The specimen on which Bornmüller & Schwarz founded this species exhibits several teratological features, and may represent but an abnormal form of *C. Epithymum*.

Specimens examined.—GERMANY: Ettersburg, near Weimar, Thuringia, on *Trifolium* (*Bornmüller* in 1923, the type, in the herbarium of the Botanical Institute at Dahlem).

151. Cuscuta Epithymum Murray

Cuscuta Epithymum Murray in Linn. Syst. Veg. Ed. 13. 140. 1774.—Reichenbach, Icon. Bot. Pl. Crit. *pl. 499*. 1827.—Schnizlein, Iconographia **2**: *pl. 144*. 1843–70.—Cosson & Germain, Atlas Fl. env. Paris *pl. A1–4*. 1845.—Des Moulins, Études Org. Cusc. 48. 1853.—Cusin, Herb. Fl. Française **16**: *f. 17, 18*. 1855.—Reichenbach & Reichenbach f. Icones Fl. Germ. & Helvet. **18**: *pl. 1344. f. 3, 4*. 1858.—Engelmann, Trans. Acad. Sci. St. Louis **1**: 461. 1859.—Syme, Eng. Bot. 3d ed. **6**: *f. 928, 929*. 1866.—Baillon, Hist. Plant. **10**: 315. *f. 211, 218*. 1891.—Hillman, Nev. Agr. Exp. Sta. Bull. 15: *f. 3*. 1892.—Piper, Wash. Agr. Exp. Sta. Bull. 8: *f. 1*. 1893.—Matthew, Bull. Torrey Club **20**: *pl. 164. f. 2*. 1893.—Toumey, Ariz. Agr. Exp. Sta. Bull. 22: *f. 9*. 1897.—Britton & Brown, Illust. Flora **3**: 27. *f. 2956*. 1898; 2d ed. **3**: 49. *f. 3443*. 1913.—Fiori & Peoletti, Icon. Fl. Ital. 337. *f. 2850*. 1902.—Coste, Fl. France **2**: 575. *f. 2541, 2542*. 1903.—Yuncker, Ill. Biol. Monogr. **6**: 112. *f. 2, 86, 145*. 1921.

Cuscuta minor Bauhin, Pinax 219. 1671.

Cuscuta europaea B. Linn. Sp. Pl. 124. 1753.

Cuscuta filiformis B. Lamarck, Fl. Franç. **2**: 307. 1778.

Cuscuta campanulata Stokes, Bot. Materia Medica **1**: 239. 1812.

?Lepimes Epithymum Rafinesque, Fl. Tellur. **4**: 91. 1836.

Cuscuta minor pallens Boreau, Fl. Centr. Fr. 1st ed. **2**: 308. 1840.

Cuscuta Trifolii Babington, Phytologist **1**: 467. 1843.

Cuscuta minor Trifolii Choisy in DC. Prodr. **9**: 453. 1845.

Cuscuta acutiflora Rota in Parlatore, Giorn. Bot. Ital. **2**: 286. 1847.

Cuscuta Epithymum pallens Lagrèze-Fossat, Fl. Tarn & Garonne 252. 1847.

Cuscuta Epithymum vulgaris Engelmann, Trans. Acad. Sci. St. Louis **1**: 461. 1859.

Cuscuta Epithymum Trifolii of various authors.

Cuscuta Muelleri Strail, Bull. Soc. Roy. Bot. Belg. **2**: 327. 1863.

Cuscuta Trifolii Strailii Mueller, Bull. Soc. Roy. Bot. Belg. **3**: 388. 1864.

Cuscuta Ulicis Godron, Mém. Soc. Sci. Nat. Cherbourg **19**: 193. 1875.

Cuscuta hygrogenes Gandoger, Flora Lyonnaise 159. 1875.

Cuscuta Epithymiphyta St. Lager, Ann. Soc. Bot. Lyon **7**: 124. 1880.

Cuscuta Novae-zealandiae Kirk, Trans. N. Zeal. **20**: 183. 1888.

Cuscuta Epithymum typica Beck, Fl. Nieder-Österreich **2**: 949. 1893.

?Cuscuta Epithymum cardianthera Beck, Fl. Nieder-Österreich **2**: 949. 1893.

Cuscuta intermedia Schur, Verhand. Naturf. Verein. Brünn **42**: 238. 1904.

Cuscuta Equiseti Schur, Verhand. Naturf. Verein. Brünn **42**: 238. 1904.

Cuscuta Epithymum Ulicis Rouy, Fl. France **10**: 356. 1908.

Cuscuta Trifolii Muelleri Rouy, Fl. France **10**: 358. 1908.

Cuscuta Coriariae Sennen & Pau, Bull. Geogr. Bot. **24**: 245. 1914.

?Cuscuta Ericae Sennen & Pau, Bull. Geogr. Bot. **24**: 245. 1914.

Stems slender, sometimes reddish or purplish. Flowers about 3 mm. long, 5-parted, sessile and numerous in dense, compact clusters. Calyx as long as, or shorter than, the corolla tube, the lobes triangular, acute, sometimes purplish,

Corolla lobes triangular acute, spreading, shorter than the campanulate tube. Scales more or less spatulate, shorter than the tube, fringed about the upper part, bridged at about a third of their height. Stamens shorter than the lobes, filaments longer than the oval anthers. Ovary globose, with a slightly thickened apex, styles and stigmas about twice as long as the ovary, stigmas filiform, slightly longer than the style. Capsule globose, circumscissile, capped by the withered corolla; seeds about 1 mm. long, rather rough, angled, compressed ovate, usually 4 in a capsule, hilum short, oblong, transverse.

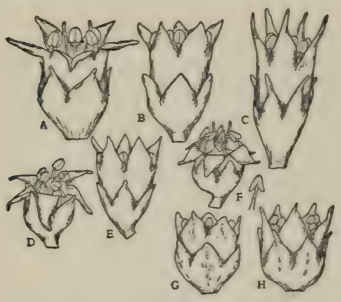

Fig. 151. A, C. Epithymum; B, var. macranthera; C, car. angustissima; D, var. alba; E, var. rubella; E, var. sagittanthera; G, var. Kotschyi; H, var. Kotschyi forma acuta.

Common throughout Europe. It has also been distributed throughout the range of the genus principally as an in festant of leguminous hosts.

Type.—The prototype of Bauhin probably from Switzerland.

KEY TO THE FORMS OF C. EPITHYMUM

Flowers smooth, not papillate
Anthers oval, ovate or cordate
Flowers more membranous than fleshy, stems mostly yellowish (sometimes purplish or reddish)
Perianth lobes obtuse or acute, not elongated to form a subulate point, flowers mostly sessile
Calyx lobes triangular-ovate, acute, mostly about equaling the corolla tube *C. Epithymum*
Calyx lobes mostly shorter, reaching to about the middle of the corolla tube var. *macranthera*
Perianth lobes elongated, subulate, flowers often on short pedicels
Flowers 3–4 mm. long, corolla cylindrical-campanulate . . . var. *angustissima*
Flowers 2–3 mm. long, corolla campanulate, clusters small, few-flowered . . . . var. *alba*
Flowers mostly more fleshy than membranous, stems, and often the flowers, red, clusters mostly few-flowered
Flowers on short pedicels, calyx commonly shorter than the corolla tube . . . . . var. *rubella*
Flowers sessile, calyx mostly equaling or exceeding the corolla tube . . . . . var. *Kotschyi*
Anthers strikingly sagittate . . . . . var. *sagittanthera*
Flowers papillate . . . . . var. *scabrella*

Cuscuta Epithymum macranthera (Heldreich & Sartori) Engelmann

Cuscuta Epithymum macranthera (Heldreich & Sartori) Engelmann, Trans. Acad. Sci. St. Louis **1**: 462. 1859.
Cuscuta macranthera Heldreich & Sartori in herb., Boissier, Diagn. Pl. Or. Nov. II. **3**^{3}: 126. 1856.
Cuscuta cassiopes Heldreich & Sartori in herb., Boissier, Diagn. Pl. Or. Nov. II. **3**^{3}: 128. 1856. (As *C. calliopes* in Engelmann, Trans. Acad. Sci. St. Louis **1**: 462. 1859.)
Cuscuta xanthonema hort. Paris, ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 462. 1859.
Cuscuta Epithymum calliopes Boissier, Fl. Orient. **4**: 115. 1879.
Cuscuta Epithymum rubella macranthera Trabut, Bull. Soc. Bot. Fr. **53**: xxxvii. 1907.

This variety is closely allied with *C. Epithymum* from which some specimens are scarcely to be distinguished. Its chief characteristic seems to be its shorter calyx which covers about half of the corolla tube, and the short, broadly triangular-ovate, acute or obtusish lobes which are shorter than in *C. Epithymum*. The flowers are medium to large, sessile, or on very short pedicels.

Southern and eastern Europe.

Specimens examined.—GREECE: Mt. Parnassus (*Orphanides 2606; Guiccardi 2965; Heldreich 32*, taken to represent the type, in the Boissier Herbarium).—TURKEY: Macedonia (*Bornmüller 1573*).—FRANCE: Velleneuve (*Lassimonne 580*); Pyrenees (*Audeoud 41*); Corsica (*Heldreich 3324*).—SPAIN: Chiva (*Wilkom 52A*).—SWITZERLAND: Geneva (*Rome* in 1876).—AUSTRIA: Moravia (*Sirjaev 57*).

Cuscuta Epithymum angustissima Engelmann

Cuscuta Epithymum angustata forma *angustissima* Engelmann, Trans. Acad. Sci. St. Louis **1**: 463. 1859.
Cuscuta subulata angustissima Béguinot in herb.

Flowers 3–4 or 5 mm. long, corolla tube cylindrical, lobes of calyx and corolla narrowly lanceolate.

Mediterranean region.

Specimens examined.—ITALY: (*Rostan* in 1863; *Guadagno* in 1907); Venetia (*Fiori & Béguinot 2511*, labelled '*C. subulata angustissima* Beg. n. comb.'); Padua (*Visiani*, the type, a specimen in the herbarium of the Missouri Botanical Garden).—FRANCE: (*Planchon* in 1857). Maritime Alps, near Esteng (*Burnat, Burnat, Burnat, Briquet, St. Yves, Cavillier & Abrezol* in 1911); Piedmont (*Burnat, Briquet, Wilczek, St. Yves, Cavillier, Abrezol & Lascaud* in 1912).—MOROCCO: (*Ball* in 1871).

Cuscuta Epithymum alba (Presl) Trabut

Cuscuta Epithymum alba (Presl) Trabut, Bull. Soc. Bot. France **53**: xxxvii. 1907.
Cuscuta alba Presl, Deliciae Pragenses 87. 1822.
Cuscuta subulata Tineo, in Gussone, Fl. Sic. Syn. **2**: 888. 1844.
Cuscuta microcephala Weltwitsch in herb. No. 1048.
Cuscuta Gussoni Gasparrini in herb.

Cuscuta Epithymum angustata forma *alba* Engelmann, Trans. Acad. Sci. St. Louis **1:** 463. 1859.
?Cuscuta acuminata Pomel, Nouv. Mater. Fl. Atlant. 88. 1874.
Cuscuta Epithymum micrantha Boissier, Fl. Orient. **4:** 116. 1879.
Cuscuta Epithymum subulata (Tineo) Trabut, Bull. Soc. Bot. France **53:** xxxviii. 1907.
Cuscuta gracilior Rouy, Fl. France **10:** 358. 1908.
Cuscuta gracilior albida Rouy, Fl. France **10:** 358. 1908.

Flowers small (2–3 mm. long), lobes narrow, elongated, pointed, on short pedicels or sessile, calyx mostly exceeding the corolla tube.

Throughout the Mediterranean region.

Specimens examined.—PORTUGAL: (*Welwitsch 1048*, type? of *C. microcephala; Ferreira 1352*).—SICILY: (*Parlatore* in 1841; *Tineo* in 1854, type? of *C. subulata; Presl*, type of *C. alba*, a specimen in the herbarium of the Missouri Botanical Garden; *Gussone*, type? of *C. Gussoni*).—GREECE: (*Orphanides 517*).—FRANCE: Corsica (*Briquet, St. Yves & Cavillier* in 1910); Pyrenees (*Debeaux* in 1878); Alpes Leman (*Briquet* in 1904); Jurassique Chain (*Briquet* in 1885).—BALEARIC ISLANDS: (*Burnatt* in 1881).—TURKESTAN: (*Capus 963*).—MOROCCO: (*Grant* in 1887; *Mellerio 99; Hooker*); Algeria (*Cosson*).

Cuscuta Epithymum rubella (Engelmann) Trabut

Cuscuta Epithymum rubella (Engelmann) Trabut, Bull. Soc. Bot. France **53:** xxxvii. 1907.
Cuscuta Epithymum angustata forma *rubella* Engelmann, Trans. Acad. Sci. St. Louis **1:** 463. 1859.
Cuscuta planiflora Koch, Fl. Germ. et Helv. 2d ed. 570. 1844; and other authors, not Tenore.
Cuscuta Epithymum rubella forma *minor* Trabut, Bull. Soc. Bot. France **53:** xxxvii. 1907.
Cuscuta gracilior rubella Rouy, Fl. France **10:** 359. 1908.

Flowers mostly short pedicellate, more or less reddish, in few-flowered clusters. Calyx shorter than the corolla tube, lobes triangular-acute. Trabut's variety *minor* seems to be an immature form.

This variety bears considerable resemblance to *C. pulchella* but differs in its longer styles.

Mediterranean region.

Type.—From southern Tyrol. Not seen.

Specimens examined.—CORSICA: (*Burnat, Briquet & Wilczek* in 1913; *Briquet, St. Yves & Cavillier* in 1910; *Burnat, Briquet, St. Yves & Abrezol* in 1906).—TUNIS: Hadjar Sghira (*Cosson* in 1888, type of Trabut's forma *minor*).

Cuscuta Epithymum Kotschyi (DesMoulins) Engelmann

Cuscuta Epithymum Kotschyi (Des Moulins) Engelmann, Trans. Acad. Sci. St. Louis **1:** 463. 1859.
Cuscuta Kotschyi Des Moulins, Études Org. Cusc. 56. 1853.

Cuscuta Epithymum rubricaulis Engelmann mss., ex Reichenbach, Fl. Germ. **18:** 86. *pl. 1343. f. 17–18.* 1858.
Cuscuta gracilior Kotschyi Rouy, Fl. France **10:** 359. 1908.

Flowers fleshy, commonly red with red stems, often more or less glandular, in small, few-flowered clusters. Calyx equaling or exceeding the corolla tube. The shape of the calyx lobes shows considerable variation. In DesMoulins' original specimen they are comparatively short and triangular. Many specimens, however, show them to be more lanceolate, with sharply pointed tips. The latter form may be designated as forma **acuta.**

Common in southern Europe.

Specimens examined.—SPAIN: Calpe (*Wolley-Dods 2257*); Aragon (*Isern* in 1850); Sierra Nevada (*Del Campo; Reuter* in 1849; *Porto & Rigo 561*); Almeria (*Hubbard & Ellman 900*); Alcoy (*Burnat* in 1881).—PORTUGAL (*Daveau* in 1879).—GREECE: (*Heldreich 768*); Carpathos (*Forsyth Major 35*).—SWITZERLAND: Tessin (*Chenevard* in 1900); Valais (*Chenevard* in 1881); Geneva (*DeCandolle* in 1821).—FRANCE: Pyrenees (*Des Moulins,* taken to represent the type, a fragment in the herbarium of the Missouri Botanical Garden); Agen (*Chaubard; Schultz 102*); Ain (*DeCandolle* in 1821); Arnas (*Gandoger* in 1900); Alpes Lemaniennes (*Briquet* in 1920); Jura Bugeysien, near Culoz (*Briquet 2356*); Savoisien Jura (*Briquet 4024; 4026; 4027; 4037; 7748*). Maritime Alps. (*Burnat* in 1872; in 1875; in 1877; in 1879; in 1882; in 1887; *Burnat, Briquet & Cavillier* in 1900; *Burnat & Cavillier* in 1892; in 1893; in 1897; in 1901; *Burnat & Gremli* in 1879; *Brugère* in 1912; *Bastreri* in 1892; *Thuret* in 1863; 1864; in 1865; *hb. Consolat 615;* in 1864; *hb. Ozanon* in 1858; *Huet du Pavillon* in 1852; *Burnat, Burnat, Burnat, Briquet, St. Yves, Cavillier & Abrezol* in 1911; *Burnat, Cavillier & Abrezol* in 1904; *Burnat, Briquet, Wilczek, St. Yves, Cavillier, Abrezol & Lascaud* in 1912; *Burnat, Briquet, Cavillier & Fehlman* in 1896; *Burnat, Briquet, Cavillier, Verguin & St. Yves* in 1902).

Cuscuta Epithymum sagittanthera Engelmann

Cuscuta Epithymum sagittanthera Engelmann, Trans. Acad. Sci. St. Louis **1:** 462. 1859.
Cuscuta Epithymum rubella sagittanthera Trabut, Bull. Soc. Bot. France **53:** xxxvii. 1907.

Flowers short pedicellate, calyx lobes triangular-ovate, acute or slightly obtusish, more or less shorter than the corolla tube, scales reaching the stamens. Anthers strikingly sagittate at base.

Only one specimen, the type, of this distinct form has been seen. It is readily distinguished by the shape of its anthers.

Specimens examined.—TUNIS: (*Kralik,* the type, a specimen in the herbarium of the Missouri Botanical Garden.)

Cuscuta Epithymum scabrella (Engelmann) n. comb.

Cuscuta Epithymum Kotschyi scabrella Engelmann, Trans. Acad. Sci. St. Louis **1:** 464. 1859.
Cuscuta scabrella (Engelmann) Trabut, Bull. Soc. Bot. France **53:** xxxviii. 1907.

This variety differs chiefly in the presence of sharp, slender papillations, especially on the calyx. I do not think it merits specific rank, as proposed by Trabut.

Mediterranean region.

Specimens examined.—SICILY: (*Gussone*, the type, a specimen in the herbarium of the Missouri Botanical Garden); Mt. Aetna (*Cavara*).—ITALY: Near Castrovillari (*Huter, Porto & Rigo 390*); Naples (*Tenore*).—TURKEY: Macedonia (*Bornmüller 1576*).

152. **Cuscuta abyssinica** Richard

Cuscuta abyssinica Richard, Tent. Fl. Abyssin. **2**: 78. 1851.
Cuscuta macrostyla Decaisne in hb. Paris.

Stems medium. Flowers 3–4 mm. long, sessile, in few-flowered glomerules, 4- or 5-parted, glandular. Calyx fleshy, about enclosing the corolla tube, lobes rounded-ovate, more or less overlapping, acute. Corolla lobes as long as, or shorter than, the campanulate-cylindrical tube, ovate-lanceolate, acute to acuminate, upright or spreading. Scales about reaching the stamens, or shorter, oblong, mostly bifid, bridged below the middle. Stamens shorter than, or nearly equaling, the corolla lobes, slender filaments much longer than the oval anthers. Styles and stigmas slender and longer than the globose ovary. Capsule globose, circumscissile, with a definitely thickened line of abscission, invested with the withered corolla; seeds rounded, hilum short, oblong, perpendicular.

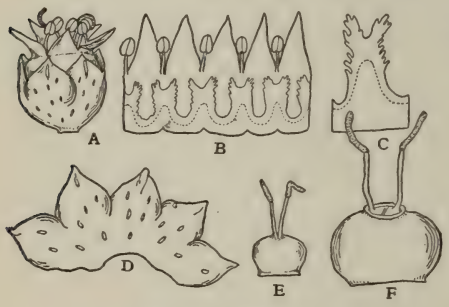

Fig. 152. C. abyssinica.

Abyssinia.

Specimens examined.—ABYSSINIA: (*Quartin-Dillon & Petit*, on *Lantanus*, the type, a specimen in the herbarium of the Missouri Botanical Garden). A second specimen, collected on a legume, with short, broad corolla lobes may be designated as forma **breviloba**. Another specimen collected by Schimper (No. *1344*) has more membranous calyx and with the calyx lobes not overlapping, and with slightly bifid scales which may be designated as forma **membranacea**.

Cuscuta abyssinica ghindensis n. var.

Cuscuta ghindensis Schweinfurth, in herb. Berol.
Cuscuta planiflora Holstii Rendle, in herb. Berol.

Stigmata tenua, aequantia aut longiora quam ± subulati styli.

Flowers 3–4 mm. long, often reddish; calyx lobes rounded-ovate, acute, fleshy, more or less granulated, equaling the corolla tube; slender stigmas about equaling or exceeding the somewhat subulate styles.

This variety resembles *C. Balansae*, but differs in its longer styles and stigmas and longer corolla lobes and larger flowers.

Eastern Africa.

Specimens examined.—ABYSSINIA: (*Hildebrandt 506*); Ghinda, alt. 950 meters, on *Ocimum* (*Schweinfurth 428*, the type of *C. ghindensis*, in the herbarium of the Botanical Institute at Dahlem); Somaliland (*Brockman 1167; Hildebrandt 1413; Godman 121*).—GERMAN EAST AFRICA: Usambara (*Holst 9114*, the type of *C. planiflora Holstii*, in the herbarium of the Botanical Institute at Dahlem).—RHODESIA: (*Eyles 327*).

153. **Cuscuta brevistyla** Braun

Cuscuta brevistyla Braun in Pl. Schimper, Richard, Tent. Fl. Abyssin. **2**: 79. 1851. *Cuscuta elegans* Nöe in herb. 518. Not Boissier & Balansa.

Stems slender to medium. Flowers 2–3 mm. long, sessile in small, compact, globose clusters, mostly 5-parted, smooth, more or less fleshy. Calyx about enclosing the corolla tube, or shorter, lobes ovate-triangular, obtuse or acutish, easily splitting to the base, commonly fleshy towards the tip. Corolla campanulate, soon becoming globular about the developing capsule, lobes somewhat shorter than the tube, triangular-ovate, connivent or more often spreading, obtuse or acutish. Stamens shorter than the lobes, filaments about equal to, or longer than the oval anthers. Scales about reaching the stamens, or shorter, mostly truncated, often bifid, shallowly fringed at the top, bridged low. Ovary globose, stigmas mostly about equaling the short styles. Capsule depressed-globose, thin, circumscissile, enveloped by the withered corolla; seeds about 5 mm. long, hilum roundish or oblong.

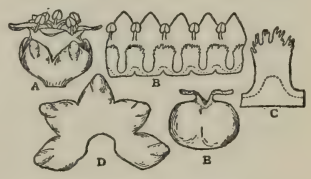

Fig. 153. C. brevistyla.

Considerable variation is observed in this species, which, in many of its characters, resembles *C. approximata* and *C. planiflora*. It differs from these species, however, in its very short styles and mostly less turgid perianth parts. Some of the specimens listed below approach *C. Balansae* in their smaller size.

In the Mediterranean region generally from Spain, the Canary Islands and Morocco to Persia and India.

Specimens examined.—SPAIN: Sierra Nevada (*Bourgeau* in 1851).—ITALY: Pedemont (*Rostan 74*).—CANARY ISLS.: (*Despreaux 595*); Teneriffe (*Boivin 313*).—MOROCCO: (*Hooker* in 1871).—ALGERIA: Prov. Oran (*Durando* in 1852).—TUNIS: Gafsa (*Pitard 441*); Cyrenaica, Imeoghgemeni (*Cosson* in 1875).—EGYPT: Sinai (*Botta*); Cairo (*Sickenberger* in 1893); Nubian coast (*Schweinfurth 1497*); Eritrea, Asmara (*Schweinfurth 2092*).—ABYSSINIA: Axum (*Schimper 1486*, the type, a specimen in the Boissier

herbarium; *14; 1120*).—Arabia: (*Botta*).—Persia: (*Bornmüller 471*); Teheran (*Kotschy 580*).—Syria: (*Haussknecht* in 1865; *Bornmüller 1120; hb. Postian 763*); Carmel (*Lowne* in 1863–64); Mts. Amanus (*Haradjian* in 1906).—Mesopotamia: Karun (*Watson*).—Afghanistan: (*Griffith 686*).—Tibet: (*Thomson*); Prov. Nubra (*Schlagintweit* in 1856).

Cuscuta brevistyla biloba Trabut

Cuscuta brevistyla biloba Trabut, Bull. Soc. Bot. France **53**: xli. 1907.

Calyx lobes longer than in *C. brevistyla*. pointed. Filaments slender. Scales about half as long as the tube and mostly bifid.

Specimens examined.—Morocco: Oudjan (*Cosson*, the type, a specimen in the herbarium of the Museum d'Histoire Naturelle at Paris).

154. **Cuscuta Balansae** Boissier & Reutter, n. nom.

Cuscuta Balansae Boissier & Reutter in herb.

Cuscuta globulosa Boissier & Reutter in herb., Boissier, Diagn. Pl. Nov. Or. II. **3**[3]: 126. 1856. Not Bentham.

Cuscuta brevistyla globulosa Engelmann, Trans. Acad. Sci. St. Louis **1**: 468. 1859.

Stems slender, commonly reddish. Flowers mostly small, about 2 mm. or less long (in some specimens 3 mm. long), fleshy, more or less papillate, commonly 4-parted. Calyx mostly red, deeply divided, enclosing the corolla, lobes triangular-ovate, acute, fleshy. Corolla campanulate, soon becoming globose about the developing capsule, lobes triangular-ovate, acute, shorter than the tube, spreading, or mostly connivent over the fruit. Stamens shorter than the lobes, the globose anthers on short filaments. Scales thin, oblong, shallowly fringed about the top, sometimes bifid, bridged low, about reaching the stamens. Ovary globose, stigmas about equaling, or sometimes longer than, the very short styles. Capsule depressed-globose, circumscissile, enveloped and capped by the withered corolla; seeds oval, about .5 mm. long, hilum small.

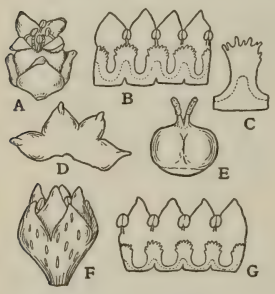

Fig. 154. A-E, C. Balansae; F-G, var. mossamedensis.

This species is very closely allied with *C. brevistyla* and was considered but a variety of that species by Engelmann. The specimens examined, however, seem distinct and it is believed they represent a separate species on the basis of the smaller, fleshy, papillate, mostly 4-parted flowers, mostly more acute perianth lobes and commonly connivent corolla lobes. It resembles *C. planiflora algeriana* also, but is to be distinguished from that form by its very short styles and mostly red flowers.

Southwestern Asia.

Specimens examined.—Arabia: (*Schweinfurth 724*).—Persia: (*Buhse 514*).—Syria: (*Peyron 925* in part); Saida (*Gaillardot 542*).—Armenia: (*Bornmüller 3439*); Sipikor (*Sintenis 3034*).—Asia Minor: Paphlagonia (*Sintenis 4363*); On the Tmolus, Yaila de Bozdagh (*Balansa 413*, the type, in the Boissier herbarium); Taurus Mts. (*Balansa 707; 684*); Cappadocia, Ali-Dagy (*Balansa 298*); Phrygia (*Bornmüller 5288*); Anatolia (*Bornmüller 1230; 1763*).

Cuscuta Balansae mossamedensis (Welwitsch) n. comb.

Cuscuta planiflora mossamedensis Welwitsch, in Hiern, Cat. African Pl. Coll. Welwitsch 1853–61. **1**: 743. 1898.

Corolla enclosed by the calyx, lobes upright, ovate, sharply pointed, scales mostly about reaching the middle of the tube, or somewhat longer. Close to *C. Balansae*, but differs in the larger flowers and shorter scales.

Specimens examined.—Africa: Angola (*Welwitsch 6141*, taken to represent the type, in the Kew herbarium).

Cuscuta Balansae socotrensis n. nom.

Cuscuta planiflora globulosa Balfour f. Bot. of Socotra 196. 1888.

Flowers somewhat larger than in *C. Balansae* and with more deeply divided calyx. Flowers fleshy, granulated, sessile, in few-flowered clusters. Corolla lobes lanceolate, sharply acute, connivent over the fruit, longer than the short tube.

Specimens examined.—Socotra (*Balfour 113*, taken to represent the type, a specimen in the Kew herbarium. On some sheets this number is mixed with *C. chinensis*).

155. **Cuscuta somaliensis** n. sp.

Flores 2–3 mm. longi, sessiles aut subsessiles, aliquantum carnosi, papillati. Corollae lobi triangulari-ovati, acuti, Corolla campanulata, lobis lanceolatis, acuminatis. Antherae breviores quam filamenta tenua. Scalae spatulatae. Stigmata ligulata, acuta, divergentia et longiora quam styli breves et aliquantum subulati. Capsula depresso-globosa, circumscissilis.

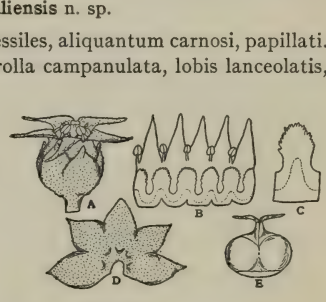

Fig. 155. C. somaliensis.

Stems medium. Flowers 2–3 mm. long sessile or subsessile in few-flowered glomerules, somewhat fleshy, papillate. Calyx about enclosing the corolla tube, somewhat appendiculate about the short pedicel, lobes triangular-ovate, acute, overlapping at the base. Corolla campanulate, becoming globose about the developing fruit, lobes lanceolate, sharply acute, spreading, as long as, or exceeding, the corolla tube. Stamens

shorter than the lobes, oval anthers shorter than the slender filaments. Scales spatulate, shallowly fringed about the top, bridged at about a third of their height, about reaching the stamens. Ovary depressed-globose, styles short and somewhat subulate, stigmas divergent and longer than the styles, flattened (ligulate) and tapering to the pointed tip. Capsule depressed-globose, circumscissile, enveloped by the withered corolla; seeds about 1 mm. long, subglobose, hilum short.

This species differs from all others of this section in the flattened (ligulate) and awl-shaped stigmas. The papillate flowers, long, lanceolate corolla lobes and sharply acute calyx lobes also serve to distinguish it.

Specimens examined.—AFRICA: Somaliland (*Ruspoh-Riva (?) 525*, the type, in the herbarium of the Botanical Institute at Dahlem).

156. **Cuscuta Letourneuxii** Trabut

Cuscuta Letourneuxii Trabut, Bull. Soc. Bot. France **53**: xlii. 1907.

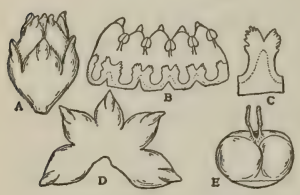

Fig. 156. C. Letourneuxii.

Stems slender, reddish. Flowers about 3 mm. long, sessile in several-flowered, dense glomerules, mostly 5-parted, fleshy, Calyx enclosing the corolla, fleshy, reddish, lobes ovate, acute, fleshy and somewhat turgid towards the apex. Corolla campanulate-globose, soon bulging at the base about the developing fruit, breaking loose and capping the fruit, lobes ovate, turgid and pointed at the apex, conniv-ent over the fruit, shorter than the tube. Anthers oval, about equaling the filaments. Scales variable, mostly bifid (sometimes bifid and entire scales present in the same flower), shorter than the tube, or nearly reaching the stamens. Ovary globose-depressed, styles short, about equaling the stigmas. Capsule globose-depressed, circumscissile, enveloped and capped by the withered corolla; seeds about 1.25 mm. long, oval, hilum short, oblong, perpendicular.

This species is closely related to *C. Balansae*, but differs in its larger, mostly smoothish flowers, and turgid, pointed corolla lobes. Type not seen.

Specimens examined.—ALGERIA: (*Letourneux* in 1874).

157. **Cuscuta planiflora** Tenore

Cuscuta planiflora Tenore, Fl. Napolit. **3**: 250. *pl. 220. f. 3.* 1824–29; Syll. Fl. Neapol. 128. 1831.—Trabut, Bull. Soc. Bot. France **53**: xl. 1907.
Succuta alba DesMoulins, Études Org. Cusc. 74. 1853.
Cuscuta Epithymum Gussone, Enum. Pl. Vasc. Ins. Inarime 212. 1855. Not Murray.
Cuscuta planiflora Tenorii Engelmann, Trans. Acad. Sci. St. Louis **1**: 466. 1859.

Cuscuta europaea Bové in herb., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 467. 1859. Not Linnaeus.

Cuscuta canariensis Choisy mss., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 467. 1859.

Cuscuta bracteosa Gasparrini in herb., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 467. 1859.

Cuscuta microcephala d'Escayrac in herb., ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 467. 1859.—Pomel, Nouv. Mat. Fl. Atlantique 88. 1874.

Cuscuta planiflora microcephala Trabut, Bull. Soc. Bot. France **53**: xli. 1907.

Cuscuta planiflora desertii Trabut, Bull. Soc. Bot. France **53**: xli. 1907.

Stems slender. Flowers mostly 1.5–2 mm. long, sessile, in small compact glomerules, fleshy, mostly whitish. Calyx enclosing the corolla, deeply divided, lobes narrow and very turgid. Corolla lobes about equaling the campanulate-globose tube, or slightly shorter, spreading, mostly fleshy and turgid at the tip. Scales mostly oblong, about reaching the stamens, or shorter, entire or infrequently bifid (both forms sometimes occurring in the same flower) shallowly fringed about the top. Stamens shorter than the lobes, anthers small, oval and shorter than, or about equaling, the filaments. Ovary globose, styles and stigmas slender. Capsule globose-depressed, definitely circumscissile, enveloped by the withered corolla; seeds oval, granulated, less than 1 mm. long.

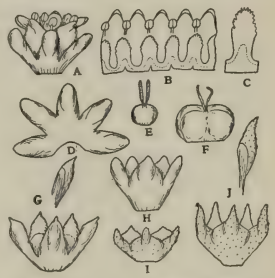

Fig. 157. A-F, C. planiflora; G, calyx and corolla lobe of var. Godronii; H, calyx of var. sicula; I, calyx of var. algeriana; J, calyx and corolla lobe of var. papillosa.

This species is distinguishable by its small flowers arranged in small glomerules, and the very turgid form of the perianth lobes. It greatly differs from *C. approximata*, but the various forms of the two species are often difficult to keep separate. Although Engelmann considered *C. planiflora* and *C. approximata* to be the same species, it is believed that a better interpretation of these two greatly varying forms will be obtained if they are kept as separate species, as has been done by Trabut. *C. planiflora desertii* has broader and less turgid lobes. Some of the forms show close alliance with *C. brevistyla*, but the longer styles and usually fleshier flower parts serve to distinguish them.

General throughout the Mediterranean region.

Specimens of C. planiflora examined.—Spain: Prov. Almeria (*Bourgeau 1298*).—Italy: (*Groves* in 1877); Naples (*Tenore*, the type, a fragment in the herbarium of the Missouri Botanical Garden).—Corsica: (*Briquet* in 1911); Ajaccio (*Burnat, Burnat, Cavillier & Abrezol*); Bonifacio (*Kralik* in 1849).—Sicily: (*Pavillon* in 1855; *151*); Isl.

Pantellari (*hb. Gussone*).—Tunis: (*Letourneux* in 1884; *Doumet, Adanson & Briquet* in 1884); Gabès (*Kralik 411b;* in 1854).—Algeria: (*Gandoger 428b*); Ghardaia (*Chevalier 454; Cosson*, taken as the type of Trabut's *C. planiflora deserti*, in the herbarium of the Museum d'Histoire Naturelle at Paris); Djelfa (*Cosson* in 1856); Metlili (*Cosson* in 1858).—Tripoli: (*Taubert 142*).—Palestine: north shores of the Dead Sea (*Heyne* in 1872); Jordan (*Meyers & Dinsmore 8059*).—Syria: (*Haussknecht* in 1865).

KEY TO THE FORMS OF C. PLANIFLORA

Flowers not papillate
- Calyx deeply divided, mostly longer than broad, free part of calyx lobes fleshy and teretely turgid
  - Calyx lobes blunt ..... *C. planiflora*
  - Calyx lobes sharply pointed ..... var. *Godronii*
- Calyx lobes broader, not so strikingly rounded or turgid
  - Calyx lobes about as broad as long, flowers mostly 5-parted ..... var. *sicula*
  - Calyx lobes very short, broad, flowers mostly 4-parted ..... var. *ambigua*

Flowers papillate
- Flowers mostly 4-parted, calyx short, lobes broad ..... var. *algeriana*
- Flowers mostly 5-parted, calyx as long as the corolla, lobes elongated and turgid at the tips ..... var. *papillosa*

Cuscuta planiflora Godronii (DesMoulins) Rouy

Cuscuta planiflora Godronii (DesMoulins) Rouy, Flore de France **10**: 359. 1908.
Cuscuta Godronii DesMoulins, Études Org. Cusc. 60. 1853.—Trabut, Bull. Soc. Bot. France **53**: xlii. 1907.
Cuscuta alba Godron in Grenier & Godron, Fl. France **2**: 505. 1850. Not Presl.
Cuscuta Godronii subpapillosa Trabut, Bull. Soc. Bot. France **53**: xlii. 1907.

Very similar to *C. planiflora*, but with the lobes of the very turgid calyx and corolla with a sharp, cuspidate, sub-apical projection.

Specimens examined.—France: Montpellier (*Richter* in 1838; *Godron*, the type of *C. Godronii*, a specimen in the herbarium of the Missouri Botanical Garden); Marseilles (*Roux* in 1851).—Sicily: (*Heldreich* in 1840).—Isl. Thasos (*Sintensis & Bornmüller 523*).

Cuscuta planiflora sicula (Tineo) Trabut

Cuscuta planiflora sicula (Tineo) Trabut, Bull. Soc. Bot. France **53**: xl. 1907.
Cuscuta sicula Tineo in herb.

Flowers somewhat larger than in *C. planiflora*, and with broader, more triangular-ovate and less turgid calyx lobes.

Specimens examined.—Tunis: (*Echihatchef* in 1878; *Letourneux* in 1887).—Cyrenaica: (*Ruhmer 234*).—Morocco: (*Cosson* in 1888; *Gandoger* in 1908).—Algeria: Oran (*Cosson* in 1852; *Romieux 880; 881*); Cherchel (*Kralik* in 1875); LaCalle (*Cosson*, taken to represent the type of Trabut's var. *sicula*, in the herbarium of the Museum d'Histoire Naturelle at Paris); Prov. Constantine, Djebel Goufi (*Cosson*).—Egypt: (*Schweinfurth* in 1887); Cairo (*Keller 401*).—Palestine: (*Barbey* in 1880); Dead Sea (*Floyer 10*).

Cuscuta planiflora ambigua (Trabut) n. comb.

Cuscuta papillosa ambigua Trabut, Bull. Soc. Bot. France **53**: xlii. 1907.

Flowers mostly 4-parted, calyx lobes very short, broad and smooth, or with slight papillations. Similar to variety *algeriana* with the exception of the papillations, which here are mostly lacking.

Specimens examined.—Morocco: Tassarement (*Maw* in 1871, the type, in the herbarium of the Museum d'Histoire Naturelle at Paris).

Cuscuta planiflora algeriana n. var.

Flores plerumque 4-fissi, papillati. Calycis lobi breves, vulgo lati quam longi.

Flowers mostly 4-parted, papillate, smaller than in the next variety. Calyx lobes short, mostly as broad as long. This variety very closely resembles *C. Balansae*, but differs in its mostly longer styles and the ordinarily spreading, not connivent, corolla lobes. It differs from variety *papillosa* with its smaller flowers and shorter calyx.

Specimens examined.—Algeria: (*Balansa* in 1853; *Cosson* in 1854, the type, in the herbarium of the Museum d'Histoire Naturelle at Paris); Prov. Alger (*Reboud* in 1854); Prov. d'Oran, Djebel Morghad (*Hochreutiner 470*).—Spain: (*Reuter* in 1849); Segovia (*hb. Gussone*).

Cuscuta planiflora papillosa Engelmann

Cuscuta planiflora papillosa Engelmann, Trans. Acad. Sci. St. Louis **1**: 467. 1859.
Cuscuta cuspidata Pomel, Nouv. Mat. Fl. Atlant. 87. 1874. Not Engelmann.
Cuscuta papillosa Trabut, Bull. Soc. Bot. France **53**: xlii. 1907.
?Cuscuta papillosa tunetana Trabut, Bull. Soc. Bot. France **53**: xlii. 1907.

Flowers more or less completely covered with papillations. Calyx and corolla lobes usually elongated, pointed and very turgid.

Some specimens approach *C. approximata leucosphaera* in general shape and form of the flower parts, but differ in the definitely papillate flowers.

Specimens examined.—Tunis: Gabes (*Kralik 40*); Djebel Zaghouan (*Kralik 410a*, taken to represent the type, a specimen in the herbarium of the Missouri Botanical Garden); Morocco (*Gandoger* in 1908).—Algeria: Prov. Oran (*Boissier & Reutter* in 1849; *Durando 22*); Djebel Santo (*Debeaux* in 1880; in 1882; in 1883); Djebel Merdjadjo (*Couderc*).

158. **Cuscuta approximata** Babington

Cuscuta approximata Babington, Ann. & Mag. Nat. Hist. **13**: 253. *pl. 4. f. 3.* 1844; **16**: 3. *pl. 1. f. 1.* 1845.—Trabut, Bull. Soc. Bot. France **53**: xxxix. 1907.
Cuscuta planiflora approximata Engelmann, Trans. Acad. Sci. St. Louis **1**: 465. 1859, in part.

Stems medium. Flowers 3–4 mm. long, sessile in few- to several-flowered

glomerules. Calyx enclosing the corolla, lobes triangular-ovate, more or less pointed, overlapping at the base, somewhat fleshy, but not markedly turgid, the lower part of the calyx is commonly yellow and shining in herbarium specimens. Corolla campanulate, but soon becoming globose about the developing fruit, lobes spreading at maturity, triangular-ovate, obtusish, more or less auricled and overlapping at the base, about equaling the tube. Stamens shorter than the lobes, anthers oval or somewhat saggitate, on filaments of about the same length. Scales shorter than the tube, or reaching the stamens, oblong, entire, or often bifid (both forms sometimes occurring in the same flower), shallowly fringed about the top, bridged low. Ovary globose-depressed, styles often flattened, especially towards the base, stigmas about as long as the styles. Capsule depressed-globose, circumscissile in a definite line, enveloped by the withered corolla; seeds oval, hilum short, oblong.

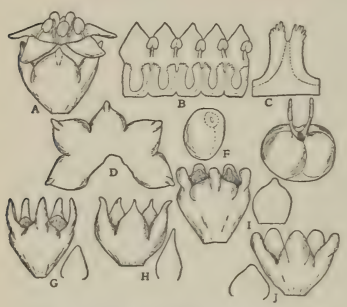

Fig. 158. A-F, C. approximata; G, calyx and corolla lobe of var. leucosphaera; H, calyx and corolla lobe of var. schiraziana; I, calyx and corolla lobe of var. ucreolata; J, calyx and corolla lobe of var. episonchum.

This is Babington's original *C. approximata*, which he described from specimens growing in England, presumably introduced from Asia with the seeds of their legume hosts. This species is markedly different from Tenore's *C. planiflora* with which Engelmann united it, but the different forms here recognized are so variable and merge one into the other to such an extent that it is difficult to establish any definite distinction between the two species, which in their extremes are so markedly distinct.

Central Asia.

Specimens examined.—England: 'Raised with clover seeds from Afghanistan' (*Bentall 1844*); Plymouth (*Hove*, in 1843). These specimens are taken to represent the type of *C. approximata*, in the Kew herbarium.—Asia: Samarkand (*Budogoski 408; . Knorring* in 1914); Dist. Kokand (*v. Minkwitz 949*); Dist. Prshewalsk (*Roshevitz 1703*); Regio Transcaspia, Ashkabad (*Sintenis 608; 789; 929; 1124*).—Turkestan: (*Capus 962; 964*); Prov. Jurgai, Syr-Darja, Transcaspia Buchara (*Androssow* in 1910).—Armenia: (*Seidlitz*).—Afghanistan: (*Griffith*).—India: Kashmir (*Stewart 4156; 6303½; 2751; Clarke 29526*); Chamba (*Duthie* in 1899); Guiral to Chitral (*Harriss 16426*).

KEY TO THE FORMS OF C. APPROXIMATA

Lobes of calyx not strikingly fleshy or turgid at the tips
  Lobes of calyx and corolla mostly triangular-ovate, acutish, flowers large (3–4 mm. long), in large clusters ..... *C. approximata*
  Lobes of calyx and corolla ovate, slenderly acute, to lanceolate ... var. *schiriziana*
Lobes of calyx with fleshy, turgid tips
  Calyx lobes mostly broader than long ..... var. *urceolata*
  Calyx lobes longer
    Calyx lobes elongated in a turgid point, corolla lobes mostly as long as, or longer than broad ..... var. *leucosphaera*
    Calyx lobes fleshy, but not especially elongated, corolla lobes short and broad .... var. *Episonchum*

Cuscuta approximata urceolata (Kuntze) n. comb.

Cuscuta urceolata Kunze, Flora **4:** 651. 1846.—Reinchenbach & Reichenbach f. Icones Fl. Germ. & Helvet. **18:** *pl. 1344. f. 1.* 1858. Not Stokes.
?Cuscuta planiflora Kunze, Flora **4:** 655. 1846. Not Tenore.
Cuscuta cupulata Engelmann, Bot. Zeit. **4:** 276. 1846.
Cuscuta asiatica Pallas in herb., ex Engelmann, Trans. Acad. Sci. St. Louis **1:** 465. 1859.
Cuscuta pontica Koch in herb. Berol.
Cuscuta Convolvuli Koch in herb. Berol.
Cuscuta planiflora approximata Engelmann, Trans. Acad. Sci. St. Louis **1:** 465. 1859, in part.—Robbins & Egginton, Colorado Agr. Exp. Sta. Bull. 248: *f. 5, 7.* 1918.—Yuncker, Ill. Biol. Monogr. **6:** 113. *f. 4, 64, 129.* 1921.
Cuscuta Epispartos Boissier & Orphanides Mss., ex Boissier, Pl. Orient. **4:** 116. 1879.
Cuscuta gracilis Rydberg, Bull. Torrey Club **28:** 501. 1901.
Cuscuta Anthemi Nelson, Bot. Gaz. **37:** 277. 1904.

Calyx shallowly divided, lobes mostly broader than long, tips fleshy and turgid. Corolla lobes ovate-orbicular. Scales mostly entire. Anthers and stigmas often red. In dried specimens the calyx is commonly golden yellow and shining and with large, prominent cells.

This variety which has smaller flowers than *C. approximata*, seems to be more common and is the form commonly found on cultivated legumes. It has become established in the western United States where it does considerable damage.

Western and southern Asia, southern Europe and northern Africa.

Specimens examined.—Asia Minor:— Smyrna (*Balansa 412*); Tmolus occidental (*Balansa 414*); Cappadocia (*Balansa 299; 300*); Lycia (*Bourgeau* in 1860); Phyrgia, Sultandagh (*Bornmüller 5289; 5292*); Taurus Mts. (*Kotschy 357*); Paphlagonia (*Sintenis 4364; 4406*); Mt. Ida (*Sintenis 734*).—Russia: Dist. Namangan (*v. Knorring 89*); Prov. Bithynia (*Bornmüller 5294*); Sarepta (*Becker* in 1884; in 1888); Ural River (*Karelin*); Wolga (*Becker 172a*); Prov. Samara, Dist. Nowo-Usen (*Bogdan 1584; 1585*); Ala-Tau Mts. (*Karelin & Kiriloff 1721*); Transcaspian, Ashkabad (*Sintenis 464; 960*).—Kur-

DISTAN: Mardin (*Sintenis 1265*); Trans-caucasin (*Kotenati 1757*); 'Reise Kleinasien' (Koch's *C. pontica* and *C. Convolvuli*); Lycia (*Pichler* in 1883).—SYRIA: (*Haussknecht* in 1865; *Haradjian 4498; Kotschy 104*); near Beilan (*Kotschy 247*); Mt. Libani (*Bornmüller 1122; 12140; Post 408; 409; Peyron* in 1890).—PERSIA: (*Haussknecht* in 1868); Riwandous (*Bornmüller 1535*); Montes Avroman & Schahu (*Haussknecht 661*, in part).—ARABIA: (*Letourneux* in 1868).—INDIA: Kashmir (*Drummond 14997*); Punjab (*Drummond 21977*); Chitral (*Toppin 323*).—TIBET: (*Thomson* in 1847; in 1848); Prov. Balti (*Schlagintweit* in 1856).—AFGHANISTAN: Shálizán to Káratígah (*Aitchison 654, 855*); BALUCHISTAN: (*Stocks 789*).

AFRICA:—EGYPT: (*Kralik* in 1848).—ABYSSINIA: (*Quartin-Dillon & Petit*).

EUROPE:—GREECE: (*Orphanides 518*); Thessaly (*Heldreich* in 1885; *4*); Crete, Canea (*Raulin 322*).—SICILY: (*Huet du Pavillon* in 1855).—FRANCE: Montpelier (*Grenier* in 1846); Prades (*Garroute* in 1876); Corsica (*Briquet* in 1908).—PORTUGAL: Cascaes (*Welwitsch*).—SPAIN: (*Aorzarena 343*); Alhambra (*Winkler* in 1873); Valladolid (*Lange 32*); Sierra Nevada (*Kuntze 283; 263* taken to represent the type of *C. urceolata*, in the herbarium of the Botanical Institute at Dahlem; *Reuter* in 1849; *DelCampo* in 1859; *Bourgeau 1299; Huter, Porto & Rigo 373; Rigo 464; Wilkomm 303*); San Geronimo (*Nilsson* in 1883; *Wilkomm 263*); Madrid (*Bourgeau* in 1854).

UNITED STATES:— WYOMING: between Sheridan and Buffalo (*Tweedy 3492*, the type of *C. gracilis*); Little Goose Fields (*Willets 558*); Laramie (*Nelson 1139; 1210*); Teton Forest Reserve (*Brandegee* in 1897); Wheatland (*Fay* in 1914); Seminole Mts. (*Nelson 4336*, the type of *C. Anthemi*).—UTAH: (*Hillman* in 1899); Salt Lake City (*Garrett 1002; Smith 1831*); Ogden (*Tracy & Evans* in 1887); Provo (*Tracy* in 1887); Little Springs (*Rydberg & Garrett 8541*).—NEVADA: Reno (*Heizer 345; Hillman*); Ormsby Co. (*Baker 1477*); Nevada City (*Hurst* in 1890).—COLORADO: Fort Collins (*coll? 4222*).—WASHINGTON: Cascade Mts. (*Kammerer 98*); Yakima Co. (*St. John 3437*).—OREGON: Powder River Valley (*Cusick 2341*).—NEW MEXICO: San Juan Co. (*Standley 8058*).—CALIFORNIA: Siskiyou Co. (*Brown 492*); Yreka (*Butler 536*).

Cuscuta approximata schiraziana (Boissier) n. comb.

Cuscuta schiraziana Boissier, Diagn. Pl. Or. Nov. I. 2^{11}: 86. 1849.
Cuscuta planiflora schiraziana Engelmann, Trans. Acad. Sci. St. Louis **1**: 466. 1859.

Glomerules mostly few-flowered. Flowers more membranous than fleshy. Calyx deeply divided with the lobes and also those of the corolla more elongated and acute than in the other forms of the species.

Some of the specimens listed below approach variety *urceolata* in having shorter and fleshier perianth segments.

Specimens examined.—PORTUGAL: (*Link*); Torres-Vedras (*Daveau* in 1881).—SPAIN: (*Wilkomm 455; Sennen 3114* with corolla more as in *C. epithymum*).—FRANCE: Corsica (*Debeaux* in 1868).—ITALY: Piedmont (*Reichenbach f. 2*).—MACEDONIA: (*Orphanides 3618*).—PERSIA: between Abushehr and Shiraz (*Kotschy 118*(*318*) the type, in the Boissier herbarium. On some sheets with this label a specimen of variety *urceolata* is also to be found); near Shiraz (*Kotschy 970*); Ashkabad (*Sintenis 788*).—SYRIA: Saida (*Gaillardot 4104*).—PALESTINE: (*Dinsmore 4509; Hayne*); east of Jordan (*Paine* in 1873).—MOROCCO: (*Pitard ?1791; ?1795*); Krifla (*hb. Cosson*); Tangier (*Hooker* in 1871).

Cuscuta approximata leucosphaera (Boissier & Heldreich) n. comb.

Cuscuta leucosphaera Boissier & Heldreich in herb.
?Cuscuta planiflora tendae Reichenbach & Reichenbach f., Fl. Germ. & Helvet. **18**: 86. *pl. 1343. f. 25–27b.* 1858.
Cuscuta planiflora approximata Engelmann, Trans. Acad. Sci. St. Louis **1**: 465. 1859, in part.
?Cuscuta planiflora bullata Trabut, Bull. Soc. Bot. France **53**: xl. 1907.

Calyx lobes with a much elongated and turgid tip which exceeds the corolla and is commonly acute. The corolla lobes are mostly more elongated and obtuse or acute. This variety is intermediate between *C. planiflora* and variety *urceolata* of this species. Trabut's variety *bullata* seems to be a smaller form.

Specimens examined.—TUNIS: Djebel Zaghouan (*Kralik* the type? of variety *bullata*).—CYRENAICA: (*Taubert 635*).—ALGERIA: Alger (*Romain 1453*).—TURKEY: Macedonia (*Biesalski 328*).—GREECE: (*Orphanides 4032; Guicciardi 395*); Mt. Parnassi (*Guicciardi 33; 2049*); Thessaly (*Sintenis 1045*); Taygetus Mts. (*Heldreich* in 1844 taken to represent the type of *C. leucosphaera* in the Boissier herbarium); Laconia (*Pease 9047*).—ASIA MINOR: Lydia (*Bornmüller 9776*).—PALESTINE: (*Barbey* in 1880); Tiberias (*Meyers & Dinsmore* in 1911).

Cuscuta approximata Episonchum (Webb & Berthelot) n. comb.

Cuscuta Episonchum Webb & Berthelot, Phytog. Canar. 3: 36. *pl. 141.* 1836–50.
Cuscuta calycina Webb & Berthelot, Phytog. Canar. 3: 37. *pl. 142.* 1836–50.
Cuscuta Epiplocamum Webb in Pl. Bourgeau *1430.*
Cuscuta planiflora Webbii Engelmann, Trans. Acad. Sci. St. Louis **1**: 466. 1859.
?Cuscuta callosa Pomel, Nouv. Mat. Fl. Atlant. 88. 1874.
Cuscuta planiflora calycina (Webb & Bert.) Trabut, Bull. Soc. Bot. France **53**: xl. 1907.
Cuscuta planiflora Episonchum (Webb & Bert.) Trabut, Bull. Soc. Bot. France **53**: xli. 1907.
?Cuscuta planiflora callosa (Pomel) Trabut, Bull. Soc. Bot. France **53**: xli. 1907.

Flowers shorter and comparatively broader than in the other forms of this species and mostly fleshier, not infrequently 4-parted. Calyx mostly deeply divided and with the lobes broad, fleshy and somewhat turgid. Corolla lobes mostly short, broad, spreading. Scales commonly truncated, often bifid. Capsule enveloped by the corolla, but with the upper part more exposed than is common for the species. *C. Epiplocamum* has broader calyx lobes while in *C. Episonchum* the flowers are smaller and the calyx is more deeply divided, with narrower lobes which unites this form with *C. planiflora.*

Common in the Canary Islands. Also found in northern Africa, Portugal, Spain and the Madeira islands.

Specimens examined.—SPAIN: Madrid (*hb. Pavon*); Ronda (*Bourgeau 331*); Calpe (*Wolley-Dod 2117*).—PORTUGAL: (*Welwitsch 192*).—MADEIRA ISLANDS: (*Edwards 839*); Porto Santo (*Mandon* in 1866).—MOROCCO: (*Balansa* in 1867; *Cosson* in 1875).—ALGERIA: (*Bonnet & Maury* in 1888); Prov. Oran (*Cosson*).—CANARY ISLANDS:

Tenerife (*Bourgeau 18; 425; 459; 1430; 1430a;* in 1855; *Perraudiere* in 1855; *Webb* in 1845; taken as the type, a specimen in the herbarium of the Missouri Botanical Garden; *Pitard 260*); Las Palmas (*Bourgeau 426; 460; Bornmüller 2605; 2606; 2607*); Gran Canaria (*Bornmüller 2611; Bolle; Cook 200; 200b; 383*); Isle de Fer (*Perraudiere* in 1855); Hierro (*Pitard 619*); Fuerteventura (*Pitard 261*).

NAMES OF SPECIES UNKNOWN TO THE AUTHOR, NOT INCLUDED IN SYNONYMY

CUSCUTA ALBA forma SUBMERSA Glück, Biol. u. Morph. Untersuch. Wasser u. Sumpfgewächse **3**: 113, *fig. 7 & 8*. 1911. Probably *C. planiflora*.

CUSCUTA ALPICOLA Brügger (O. Rh. p. 72 Z. 8) ex Jahresbericht Naturfsch. Gesellsch. Graubündens **29**: 45. 1884–85. = *C. Epithymum?*

CUSCUTA ATLANTICA Trabut, Bull. Soc. Bot. France **53**: xli. 1907.

CUSCUTA BUCHARICA Palibine, Jour. Russ. Bot. 28. 1915.

CUSCUTA CANDICANS Genn., ex Nyman, Consp. Fl. Europ. Suppl. ii. **1**: 221. 1889. Probably a form of *C. planiflora*.

CUSCUTA FILIFORMIS Linnaeus, ex Jackson, Index Linn. Herb. 66. 1912.

CUSCUTA KURIENSIS Vierhapper, Denkschr. Math.-Natur. Kaiserl. Akad. Wissensch. Wien **71**: 418. 1907.

CUSCUTA LAXIFLORA Aznavour, Magyar Bot. Lapok **4**: 137. 1905. = *C. Kotschyana?*

CUSCUTA MACROCARPA Don, ex Loudon, Hortus Brit. suppl. iii: 530. 1850. = *C. lupuliformis?*

CUSCUTA MAROCCANA Trabut, Bull. Soc. Bot. France **53**: xl. 1907.

CUSCUTA PUBERULA Klotsch in Schomburgh, Fauna & Flora Br. Guinea 1154. 1848, without description.

CUSCUTA RACEMOSA Sesse & Mociño, Fl. Mexicana 2d ed. 27. 1894.

CUSCUTA RUFICAULIS Gandoger, Fl. Lyonnaise 158. 1875. = *C. epithymum?*

CUSCUTA SAROTHAMNI Brügger, Jahresber. Naturf. Gesell. Graubündens **29**: 45. 1884–85. = *C. epithymum?*

CUSCUTA STENANTHA Trabut, Bull. Soc. Bot. France **53**: xxxviii. 1907. = form of *C. epithymum?*

CUSCUTA STENOCALYCINA Palibine, Jour. Russ. Bot. 26. 1915.

CUSCUTA SUBTINCTA Gandoger, Fl. Lyonnaise 158. 1875. = *C. epithymum?*

CUSCUTA SUBUNIFLORA Koch, Linnaea **22**: 748. 1849. = *C. brevistyla?*

Cuscuta funiformis Willdenow hb. 3156 (*C. fusiformis* Willd., ex Roemer & Schultes Syst. Veg. **6**: 205. 1820), and *Cuscuta triflora* E. Meyer in Pl. Drege, ex Engelmann, Trans. Acad. Sci. St. Louis **1**: 519. 1859 are not Cuscutas, but species of *Cassytha*.

In this index collectors' numbers appear after their names in italics, as in the text; or the year in roman type enclosed in parentheses; where neither appears on the specimen the fact is indicated by a dash ——.

Abbott
1068. C. obtusiflora glandulosa
Abrams & McGregor
505; 522. C. denticulata
Ackermann
(1832). C. racemosa miniata
—— C. parviflora
Adiassewich
(1908). C. Lehmanniana
Aitchison
430; 1089. C. Kotschyana
654, 855. C. approximata urceolata
Alexander
(1847). C. africana
—— C. nitica
Allen
30; 267. C. partita
Andersson
(1852). C. chilensis
—— C. acuta
Andrieux
73; 214. C. corymbosa stylosa
Androssow
(1910). C. approximata
Anisits
462. C. xanthochortos lanceolata
2395; 2555; 2854. C. incurvata
Annter
(1843). C. suaveolens
Anthony & Tate
205. C. foetida
Anuma
(1905). C. australis
Aorzarena
343. C. approximata urceolata
Arechavaleta
82. C. xanthochortos carinata
Arimoto
(1903). C. japonica
Arsène
2271. C. mitraeformis
Ascherson
353; 537; 1070. C. pedicellata
Aucher-Éloy
—— C. Kotschyana
1418. C. pedicellata
1420; 3183. C. babylonica
Audeoud
41. C. Epithymum macranthera
Backer
8276. C. timorensis
8344; 25298. C. reflexa
32298. C. australis
Baenitz hb. Europ.
5012. C. Gronovii calyptrata
Bagshawe
1341; 1398. C. cordofana
Bailey & Bailey
161. C. globulosa
6457. C. americana
Baines
(1863). C. hyalina
Baker
41. C. salina major
1477. C. approximata urceolata
(1905). C. Kilimanjari
(1908). C. exaltata
Bakhuizen van den Brink
3665. C. australis
Balansa
297; (1856). C. monogyna
298; 413; 684; 707. C. Balansae
299; 300; 412; 414. C. approximata urceolata
411. C. Lehmanniana esquamata
708. C. babylonica elegans
2064; 2066. C. xanthochortos lanecolata
(1853). C. planiflora algeriana
(1867). C. approximata Episonchum
Baldacci
28; 188. C. palaestina
Balfour
108; (1880). C. chinensis
113. C. Balansae socotrensis
Ball
(1871). C. Epithymum augustissima
(1882). C. chilensis
(1882). C. platyloba
Bang
115 in pt. C. grandiflora
115 in pt; *1304*. C. globifera
1303. C. odorata

Banks & Solander
—— C. chinensis
Barber
32. C. appendiculata macroflora
Barbey
(1880). C. palaestina
(1880). C. planiflora sicula
(1880). C. approximata leucosphaera
Barchet
519. C. japonica
Barnes & Land
567. C. mitraeformis
Baron
2648. C. cordofana
3466. C. madagascarensis
Basedow
(1902–04). C. victoriana
Bastreri
(1892). C. Epithymum Kotschyi
Bauer
205. C. gymnocarpa
Beardsmore
—— C. campestris
Beauvais
233. C. japonica formosana
Becker
172a; (1884; 1888). C. approximata urceolata
—— C. monogyna
Beechy
—— C. gracillima
Belander
(1825). C. monogyna
Beltfreund & Koester
342. C. cristata
Bennie
250. C. appendiculata macroflora
Bent & Bent
(1897). C. chinensis
Bentall
1844. C. approximata
Bentham
—— C. americana
—— C. corymbosa grandiflora
—— C. globulosa
Bequaert
4195. C. cordofana
Berg
(1873). C. cristata
Berlandier
822. C. corymbosa stylosa
1103. C. corymbosa grandiflora
2285. C. indecora
Bernoulli
59. C. corymbosa grandiflora
Bernoulli & Cairo
1916. C. corymbosa grandiflora
Bertand, Bro.
48. C. fasciculata
Bertero
201 & 940; 205. C. suaveolens
—— C. globulosa
Betche
(1897). C. australis
v. Better
142. C. micrantha latiflora
Biesalski
328. C. approximata leucosphaera
Bigelow
(1850). C. obtusiflora glandulosa
(1851). C. exaltata
(1854). C. californica apiculata
Billot
152. C. suaveolens
645; 3436. C. australis Tinei
Bipont herb.
—— C. suaveolens
Birschell
—— C. corymbosa grandiflora
Blanche
51; 174; 1434. C. monogyna
172; 196. C. palaestina syriana
707. C. palaestina
Blanchet
85; 736. C. americana
3047. C. partita
Bodinier
939. C. japonica formosana
Bogdan
1584; 1585. C. approximata urceolata
Bohnhof
311. C. australis
Boissier
(1846). C. palaestina
—— C. australis Tinei
Boissier & Reutter
(1849). C. planiflora papillosa
Boivin
313. C. brevistyla
Boldingh
587B; 1413B; 2349B; 3480B; 4759; 7381. C. americana

5136; 5220; 7081; 7349. C. partita
7379. C. Boldinghii
Bolle
—— C. approximata Episonchum
Bolus
2406. C. africana
4427B. C. nitida
8580. C. angulata
Bon
2127; 2796. C. australis
Bonneau
(1875). C. monogyna
Bonnet & Maury
(1888). C. approximata Episonchum
Bonpland
—— C. floribunda
Boorman
(1912). C. australis
(1914). C. campestris
Bornmüller
275; 448. C. capitata
471; 1120. C. brevistyla
473. C. pedicellata
641. C. xanthochortos
1122; 1535; 5289; 5292; 5294; 12140. C. approximata urceolata
1230; 1763; 3439; 5288. C. Balansae
1232; 1240; 1580; 2655; 4509. C. monogyna
1536; 1538; 4958; 4959. C. babylonica
1573. C. Epithymum macranthera
1576. C. Epithymum scabrella
2605; 2606; 2607; 2611. C. approximata Episonchum
9776. C. approximata leucosphaera
(1923). C. stenoloba
Botta
—— C. chinensis ciliaris
—— C. palaestina
—— C. brevistyla
Bouchet
—— C. monogyna
Bourgeau
18; 331; 425; 426; 459; 460; 1430; 1430A; (1855). C. approximata Episonchum
971. C. corymbosa grandiflora
1298. C. planiflora
1299; (1854; 1860). C. approximata urceolata
3267. C. jalapensis
3353; 7995. C. corymbosa stylosa
(1851). C. brevistyla
Bové
354. C. pedicellata
Bowie
—— C. nitida
Bowker
492. C. cassytoides
Boykin
—— C. obtusiflora glandulosa
Brade
6026. C. racemosa miniata
Brandegee
9. C. corymbosa grandiflora
404; (1893; 1915); —— C. tuberculata
406. C. leptantha
409; (1890; 1897; 1904). C. macrocephala
(1904). C. polyanthemos
(1889). C. Veatchii
(1893). C. gracillima esquamata
(1897); C. approximata urceolata
(1909); —— C. denticulata
Brant
—— C. kurdica
Braun
(1848). C. suaveolens
Brenning
91. C. micrantha Holwayii
Briquet
2356; 4024; 4026; 4027; 4037; 7748; (1920). C. Epithymum Kotschyi
(1885; 1904). C. Epithymum alba
(1908). C. approximata urceolata
(1911). C. planiflora
Briquet, St. Yves & Cavillier
(1910). C. Epithymum alba
(1910). C. Epithymum rubella
Brittlebank
(1915). C. suaveolens
Britton, Britton & Brown
5820; 5842; 6365. C. americana
Britton, Britton & Cowell
2109. C. obtusiflora glandulosa
Britton, Britton & Kemp
2. C. americana
Britton, Hazen & Freeman
947. C. americana
Britton & Millspaugh
2208; 2811; 5519; 5925; 5963. C. americana
Britton & Shafer
2915. C. partita
Broadway
2464. C. americana

Brockman
1167. C. abyssinica ghindensis
Brown
492. C. approximata urceolata
—— C. australis
—— C. chinensis
Brugère
(1912). C. Epithymum Kotschyi
Bruni
—— C. australis Tinei
Buchtien
113; 133; 753; 3235; 4504. C. globiflora
460; 752; 2946; 4501; (1910; 1912). C. grandiflora
1157; 4502; 4503; 4507. C. chilensis
4510. C. campestris
4511. C. japonica
Budogoski
408. C. approximata
817. C. Lehmanniana
Buhse
514. C. Balansae
(1847). C. monogyna
Bullock
207. C. japonica formosana
Bungeanum herb.
(1858). C. monogyna
(1858). C. Lehmanniana esquamata
—— C. Kotschyana
Bunting
89. C. cordofana
Burchell
291. C. nitida
667A. C. racemosa nuda
3178. C. cassytoides
5730. C. africana
7792. C. angulata
—— C. corymbosa grandiflora
Burkart
450; 451. C. cristata
1206; 3673. C. campestris
3394; 3761. C. platyloba
Burman
—— C. africana
—— C. nitida
Burnat
(1872; 1875; 1877; 1879; 1881; 1882; 1887). C. Epithymum Kotschyi
(1881). C. Epithymum alba
Burnat, Briquet, & Cavillier
(1900). C. Epithymum Kotschyi
Burnat, Briquet, Cavillier, & Fehlman
(1896). C. Epithymum Kotschyi
Burnat, Briquet, Cavillier, Verguin, & St. Yves
(1902). C. Epithymum Kotschyi
Burnat, Briquet, St. Yves, & Abrezol
(1906). C. Epithymum rubella
Burnat, Briquet, & Wilczek
(1913). C. Epithymum rubella
Burnat, Briquet, Wilczek, St. Yves, Cavillier, Abrezol, & Lascaud
(1912). C. Epithymum angustissima
(1912). C. Epithymum Kotschyi
Burnat, Burnat, Burnat, Briquet, St. Yves, Cavillier, & Abrezol
(1911). C. Epithymum angustissima
(1911). C. Epithymum Kotschyi
Burnat, Burnat, Cavillier, & Abrezol
—— C. planiflora
Burnat & Cavillier
(1892; 1893; 1897; 1901). C. Epithymum Kotschyi
Burnat, Cavillier, & Abrezol
(1904). C. Epithymum Kotschyi
Burnat & Gremli
(1879). C. Epithymum Kotschyi
Bush
1405. C. obtusiflora glandulosa
Bushnell
(1869). C. chinensis
Bustamente
83. C. mitraeformis
Butler
536. C. approximata urceolata
Caley
—— C. australis
Calldengh
—— C. chilensis
Cameron
(1909). C. campestris
Campbell
1834. C. reflexa anguina
Camus
2440. C. australis Tinei
Capus
962; 964. C. approximata
963. C. Epithymum alba
967; 968; (1881). C. Lehmanniana
Cavara
—— C. Epithymum scabrella
Cesati
—— C. australis Cesatiana

Chaffanjon
1224. C. lupuliformis asiatica
(1896). C. japonica
Champion
457. C. japonica formosana
hb. Chapman
(1863). C. obtusiflora glandulosa
Chaubard
—— C. Epithymum Kotschyi
Chenevard
(1881; 1900). C. Epithymum Kotschyi
Chevallier
454. C. planiflora
Ching
8863. C. japonica formosana
Chrismar
—— C. americana
—— C. jalapensis
—— C. Boldinghii
Chun & Chien
8241. C. australis
Claren
11792. C. odorata Holwayana
Clarke
4156; 25104; 34262D; 34262F; 40354B; 45470. C. reflexa
24058; 29062. C. australis Cesatiana
29526. C. approximata
29893A. C. capitata
32053. C. pedicellata
33983A; 33983B. C. australis
Claussen
306. C. americana
Clemens
1928; 1929; 6352. C. chinensis
1928A. C. australis
6351. C. japonica
Clemens & Clemens
147. C. leptantha
Cockerell
(1925). C. Cockerellii
hb. Consolat
615; (1864). C. Epithymum Kotschyi
Constantine
—— C. obtusata
Cook
200; 200b; 383. C. approximata Episonchum
Cook & Gilbert
219; 249; 1220. C. grandiflora
Cooper
337. C. appendiculata macroflora
2785; 2790; 2791. C. natalensis
Cosson
(1852; 1888); —— C. planiflora sicula
(1854). C. planiflora algeriana
(1856; 1858); —— C. planiflora
(1861). C. obtusata
(1875); —— C. approximata Episonchum
(1875). C. brevistyla
(1888). C. Epithymum rubella
—— C. Epithymum alba
—— C. brevistyla biloba
—— C. approximata schiraziana
hb. Cosson
346. C. pedicellata
Cosson & Germain
—— C. suaveolens
Couderc
—— C. planiflora papillosa
Couthouy
(1855). C. stenolepis
—— C. foetida
Cowdry
413. C. japonica
778. C. chinensis
Cuming
350. C. chilensis
Curran
(1883; 1888). C. denticulata
Cusick
2341. C. approximata urceolata
Dalziel
1152; 1353. C. cordofana
—— C. hyalina
Darwin
(1835). C. gymnocarpa
Daveau
(1879). C. Epithymum Kotschyi
(1881). C. approximata schiraziana
David (l'Abbé)
(1865). C. japonica
Davis (1908). C. suaveolens
Dawe
270. C. corniculata
579. C. partita
Deam
33011. C. cuspidata
Debeaux
(1868). C. approximata schiraziana
(1878). C. Epithymum alba
(1880; 1882; 1883). C. planiflora papillosa
(1897). C. campestris

De Candolle
(1821). C. Epithymum Kotschyi
Degen
(1898). C. lupuliformis
Degener & Wiebke
2000, 2769. C. sandwichiana kailuana
2516. C. sandiwichiana
Delavy
3521; 3612. C. reflexa anguina
3655. C. japonica
DelCampo
(1859). C. approximata urceolata
—— C. Epithymum Kotschyi
Delisle
—— C. monogyna
Demidoff
—— C. chinensis ciliaris
Depreaux
595. C. brevistyla
DesMoulins
—— C. Epithymum Kotschyi
Dickens
(1877). C. japonica
Diels
(1917). C. Gronovii calyptrata
Dinsmore
4509. C. approximata schiraziana
Dinter
(1923). C. hyalina
Douglas
—— C. californica
—— C. curta
Doumet, Adanson & Briquet
(1884). C. planiflora
Dowson
439. C. Kilimanjari
Drege
7833; (1838); —— C. africana
8037. C. cassytoides
(1835; 1838); —— C. nitida
—— C. angulata
Drummond
14997; 21977. C. approximata urceolata
Ducloux
514; 4914. C. japonica
Dudgeon
(1923). C. reflexa
Duges
4: 152. C. tinctoria
(1880). C. costaricensis
Dunn
4252. C. australis
Durando
22. C. planiflora papillosa
(1852). C. brevistyla
Dürer
(1889; 1899). C. Gronovii calyptrata
Dusén
10005. C. platyloba
11349. C. racemosa nuda
Dùss
1878; 2468. C. americana
Duthie
7533; 13527. C. reflexa anguina
11171. C. australis Tinei
(1874). C. palaestina
(1883). C. Kotschyana
(1899). C. approximata
M. E.
347. C. rugosiceps
Echihatchef
(1878). C. planiflora sicula
Ecklon
341; 1010. C. nitida
Ecklon & Zeyher
1.11; 20.77.11; 21.1.11; 62.11. C. nitida
22.70.10. C. africana
Edgeworth
450. C. reflexa anguina
(1844). C. reflexa
Edmonston
—— C. grandiflora
Edwards
839. C. planiflora Episonchum
Eggers
144. C. americana
4534; (1882). C. globulosa
Ehrenberg
840. C. mitraeformis
—— C. pedicellata
Eisenbarth
(1898). C. Gronovii calyptrata
Ekman
10455. C. Boldinghii
196; 4949; (1914). C. obtusiflora glandulosa
Ellenbeck
1409. C. Kilimanjari
Elliott
254. C. Kilimanjari
Endlich
268. C. durangana

1399. C. mitraeformis
Engelmann
(1841). C. Coryli
(1880). C. erosa
(1880). C. odontolepis
—— C. Polygonorum
—— C. Cephalanthi
Engler
767. C. timorensis
Entomologist at Cedara
(1918). C. campestris
Esquirol
—— C. japonica formosana
État-Major Général Égyptien Expéd.
299. C. hyalina
Etheridge
—— C. chinensis
Eyles
327. C. abyssinica ghindensis
352. Kilimanjari
Faurie
346. C. chinensis
370; 782; 1494; 2522; 3861; (1900). C. australis
781; 1005; 1313; 2038; 3111; 13543; (1886; 1902). C. japonica
1045. C. sandwichiana
Fay
(1914). C. approximata urceolata
Fedtschenko
1; (1897). C. Lehmanniana
47. C. gigantea Engelmanni
57. C. pedicellata
285. C. australis
Fendler
946. C. corymbosa grandiflora
2069. C. americana
Feriola
2514. C. campestris
Ferriera
1352. C. Epithymum alba
1656. Cl australis Tinei
Fiebrig
432; 478. C. xanthochortos carinata
2523. C. boliviana
3045. C. insquamata
3230; 3232. C. grandiflora
4254; 5083. (1909). C. incurvata
6705; —— C. xanthochortos lanceolata
(1903–04). C. globiflora
Figari
—— C. cordofana
Fink
—— C. strobilacea
Fiori & Béguinot
2511. C. Epithymum angustissima
Fischer
110. C. Boldinghii
271. C. jalapensis
(1836). C. pedicellata
—— C. lupuliformis asiatica
Fishlock
489. C. globulosa
Flanagan
1422. C. appendiculata macroflora
Floyer
10. C. planiflora sicula
Focke
383. C. americana
Forbes
(1872). C. chinensis
Ford
—— C. japonica formosana
Forrest
2980. C. reflexa
3014. C. reflexa anguina
Forsyth Major
35. C. Epithymum Kotschyi
Franc
737. C. campestris
Fredholm
305. C. compacta efimbriata
Frere
(1857). C. hyalina
Fries
229. C. americana
906. C. Friesii
1287. C. grandiflora
Fruchard
(1874; 1875). C. platyloba
—— C. suaveolens
Fuertes
194. C. globulosa
Funk
—— C. triumvirati
Gaillardot
542. C. Balansae
4104. C. approximata schiraziana
—— C. palaestina syriana
Galander
(1880). C. cristata

Galeotti
1412. C. corymbosa stylosa
Galpin
1760. C. suaveolens
Gamble
21149. C. hyalina
25677. C. reflexa
Gammie
757. C. reflexa anguina
—— C. reflexa
Gandoger
428b. C. planiflora
7215; 12040. C. palaestina
(1900). C. Epithymum Kotschyi
(1908). C. planiflora sicula
(1908). C. planiflora papillosa
(1920). C. campestris
Garaventa
1466, 1467, 1468. C. chilensis
Gardner
616. C. reflexa
1775. C. americana
2425. C. umbellata desertorum
2684. C. partita
3348. C. bracteata
Garrett
1002. C. approximata urceolata
Garroute
512. C. suaveolens
(1876). C. approximata urceolata
Gaudichaud
1; 37. C. sandwichiana
124; (1832). C. chilensis
129. C. reflexa anguina
Gaumer
90. C. cozumeliensis
705. C. globulosa
Gaumer & Sons
23602. C. americana
Gay
37. C. odorata Holwayana
38; 815; 2168. C. odorata
195; 816; 817. C. chilensis
203; 449. C. suaveolens
538. C. micrantha
2260; 2287. C. grandiflora
Genty
710; 2793; 3952; (1896). C. australis Tinei
Germain
(1855–56). C. chilensis
Gerrard
1337. C. Gerrardii
Geyer
(1841). C. Gronovii Saururi
Ghiesbreght
186. C. corymbosa stylosa
Gibbs
214. C. campestris
Gibelli
(1874). C. australis Cesatiana
Gibert
46 in pt; *175; 284*. C. platyloba
46 in pt. C. suaveolens
78. C. cristata
283. C. xanthochortos
Gillies
—— C. chilensis
—— C. indecora integriuscula
Giraldi
3278. C. japonica formosana
Glaziou
11279; 21805; 21808. C. platyloba
19676; 20422. C. racemosa miniata
19677. C. racemosa nuda
21809. C. orbiculata
21810. C. goyaziana
21811; 21811½. C. serrata
Godman
121. C. abyssinica ghindensis
Godron
806. C. suaveolens
—— C. monogyna
—— C. planiflora Godronii
Gollmer
—— C. corymbosa grandiflora
Gonnet
—— C. monogyna
Goudot
—— C. grandiflora
Grabendorfer
(1899). C. tuberculata
Graham
250. C. jalapensis
Grant
(1887). C. Epithymum alba
Green
275. C. leptantha
Greene
1046. C. suaveolens
(1880). C. tuberculata

Gregg
570. C. tinctoria
(1849). C. americana
—— C. Gronovii calyptrata
Grenier
(1846). C. approximata urceolata
(1850). C. monogyna
Griffith
682; 684. C. monogyna
685. C. chinensis ciliaris
686. C. brevistyla
687. C. chinensis
690; 691. C. pulchella
1031 (*683*). C. gigantea
—— C. reflexa
—— C. capitata
—— C. approximata
Griffith & Thornber
21. C. odontolepis
Grove
(1877). C. planiflora
Guadagno
(1907). C. Epithymum angustissima
Guiccardi
33; 395; 2049. C. approximata leucosphaera
2965. C. Epithymum macranthera
Gunn
1991. C. tasmanica
Gussone
—— C. Epithymum alba
—— C. Epithymum scabrella
—— C. planiflora
—— C. planiflora algeriana
Haaver
(1925). C. timorensis
Hahlman
112. C. cordofana
Hahn
18. C. corymbosa grandiflora
754. C. campestris
Hahnald
639. C. lupuliformis
Halácsy
(1893). C. palaestina
Hall
(1853). C. stenolepis
Hallier
C160a. C. australis
Hance
111. C. japonica
10514. C. australis
Hancock
45. C. macrocephala
354. C. japonica formosana
Haradjian
4498. C. approximata urceolata
(1906). C. brevistyla
Harper
147. C. Harperi
Harriss
16426. C. approximata
Hartman
52. C. odontolepis
119. C. dentatasquamata
179. C. tuberculata
Hartweg
1237. C. corymbosa grandiflora
1238. C. foetida pychantha
1863. C. occidentalis
Harvey
(1856). C. chilensis
Harz
5298; (1904; 1905). C. Gronovii calyptrata
Hassler
3918. C. obtusiflora
5113; 4694. C. xanthochortos lanceolata
8178. C. incurvata
Hastings
146; 291; 395. C. chilensis
154. C. micrantha Holwayi
Haught
11. C. paitana
154. C. Haughtii
Hauman
2997. C. tucumana
Haussknecht
659; (1867). C. babylonica
661 in part; (1865; 1868). C. approximata urceolata
661 in part C. Kotschyana caudata
661A. C. Kotschyana
662A. C. kurdica
663; (1855; 1867; 1868); —— C. monogyna
(1865). C. brevistyla
(1865). C. planiflora
(1868). C. babylonica elegans
(1868; 1885). C. palaestina
(1868). C. Haussknechtii
Havard
4. C. leptantha
Hayne
—— C. approximata schiraziana

Heermann
—— C. subinclusa
Hehne
—— C. reflexa anguina
Heidenreich
—— C. lupuliformis
Heizer
345. C. approximata urceolata
Heldreich
4; (1885). C. approximata urceolata
32; 3324. C. Epithymum macranthera
237; 2048; (1855; 1877; 1892). C. palaestina
768. C. Epithymum Kotschyi
3471. C. monogyna
(1840). C. planiflora Godronii
(1844). C. approximata leucosphaera
(1845). C. obtusata
(1880). C. suaveolens
Heller
470; 6169. C. globulosa
Henry
2475; 3185. C. japonica formosana
2632; 9693. C. japonica
12738. C. reflexa
v. Hermann
686. C. obtusiflora glandulosa
Heron
(1909). C. australis
Herrera
678. C. grandiflora
Heyde
287. C. tinctoria
Heyde & Lux
2912. C. rugosiceps
Heyne
(1872). C. planiflora
Hildebrandt
506; 1413. C. abyssinica ghindensis
Hieronymus
(1883). C. brevisquamata
Hieronymus & Lorentz
124. C. grandiflora
Hieronymus & Niederlein
745; 846. C. cristata
Hillman
(1891). C. denticulata
(1899); —— C. approximata urceolata
(1907). C. suaveolens
Hillosen
2538; 4484. C. platyloba
Hioram (Bro.)
2279. C. globulosa
Hitchcock
20141. C. prismatica
20896. C. foetida pycantha
21702. C. foetida
22425. C. Hitchcockii
Hochreutiner
470. C. planiflora algeriana
Hoehne
1026; 1048; 4483. C. partita
4016. C. obtusiflora
6187. C. platyloba
Hoffmann
463. C. costaricensis
Hohenacker
489. C. micrantha latiflora
(1838); —— C. monogyna
Holmgren
442; (1920). C. foetida
594. C. grandiflora
908; 908a. C. stenolepis
924. C. corymbosa grandiflora
Holst
6909. C. cordofana
8909; (1893). C. Kilimanjari
9114. C. abyssinica ghindensis
Holton
543. C. grandiflora
Holway & Holway
1075; 1847. C. platyloba
1374. C. parviflora
(1919). C. micrantha Holwayii
(1919; 1920). C. chilensis
(1920). C. stenolepis
(1920). C. odorata Holwayana
(1920). C. grandiflora
(1920). C. globiflora
(1920). C. odorata
(1920). C. foetida
Holz
9062. C. timorensis
hb. Hongkong
1961. C. japonica formosana
Hooker
(1845). C. macrocephala
(1871). C. brevistyla
(1871). C. approximata schiraziana
—— C. reflexa
—— C. Epithymum alba

Hooker & Hanbury
(1860). C. monogyna
Hooker & Thomson
—— C. reflexa
Hostman
464. C. americana
Hove
(1843). C. approximata
Howard
(1888). C. leptantha
Hu
405. C. japonica
Hubbard & Ellman
900. C. Epithymum Kotschyi
Huet du Pavillon
(1852). C. Epithymum Kotschyi
(1855). C. palaestina
(1855). C. approximata urceolata
Humboldt
—— C. americana
—— C. corymbosa grandiflora
—— C. grandiflora
—— C. umbellata
—— C. obtusiflora
—— C. foetida
Hurst
(1890). C. approximata urceolata
Husbands
1015. C. chilensis
Huter, Porto & Rigo
372. C. triumvirati
373. C. approximata urceolata
390. C. Epithymum scabrella
Hutton
923. C. appendiculata macroflora
Irat
(1849). C. suaveolens
Isern
(1850). C. Epithymum Kotschyi
Jaccard
(1897). C. Lehmanniana
Jacquemont
149; 2520. C. reflexa anguina
876. C. australis Cesatiana
1109; 2183; 2313. C. reflexa
1550. C. capitata
Jameson
542. C. obtusiflora
(1864). C. foetida
Janka
(1865). C. australis Tinei
Jeoward
84. C. campestris
Jepson
5c. C. Jepsonii
80a. C. brachycalyx apodanthera
(1893). C. suaveolens
Jermy
(1904). C. exaltata
Joannes (Fr.)
—— C. xanthochortos
Johandiez
852. C. triumvirati
937b. C. monogyna
Johnston
86. C. Kilimanjari
3222. C. corymbosa stylosa
3430; 3439. C. Veatchii
3707. C. leptantha
(1887). C. reflexa anguina
Johnstone
(1915). C. australis
(1915). C. victoriana
Jolis hb.
63. C. chinensis
Jones
3862; (1884). C. denticulata
Jörgensen
1160. C. argentinana
1420. C. grandiflora
1702. C. globiflora
Joseph (Fr.)
3874. C. suaveolens
Jussieu
—— C. foetida
Kammerer
98. C. approximata urceolata
Karelin
—— C. approximata urceolata
Karelin & Kariloff
926. C. lupuliformis asiatica
1721. C. approximata urceolata
Karolkoff & Krauss
—— C. Lehmanniana
Karsten
—— C. corniculata
—— C. americana
Karwinski
(1827; 1842). C. tinctoria
Kashyap
(1922). C. hyalina
(1923). C. reflexa

Kearney
52. C. brachycalyx
Keet
1009. C. africana
Keller
401. C. planiflora sicula
Kellerman
4591; 5576; 5916A. C. corymbosa grandiflora
7567. C. tinctoria Kellermaniana
Kerber
248. C. floribunda
Kerr
4326; 11056. C. chinensis
Killip & Smith
16417; 20180. C. corymbosa grandiflora
17906; 19645. C. grandiflora
21045. C. americana
21684. C. odorata squarrulosa
21827. C. bella
21843; 21858; 21909; C. lucidicarpa
Kirilow
—— C. japonica paniculata
Kirkwood
50. C. decipiens
v. Knorring
89. C. approximata urceolata
104. C. Lehmanniana
(1914). C. approximata
v. Knorring & Minkwitz
334. C. Lehmanniana
1590. C. monogyna
Koch
(1837). C. pedicellata
—— C. approximata urceolata
Koenig
292. C. monogyna
Koenig & Woronow
—— C. monogyna
Komarôv
1302. C. japonica
(1893). C. capitata
Koorders
37381B. C. reflexa
Kotenati
1757. C. approximata urceolata
Kotschy
104; 247; 357. C. approximata urceolata
118 (318); 970. C. approximata schiraziana
289; 388b. C. kurdica
388a. C. babylonica
431. C. chinensis ciliaris
580. C. brevistyla
713. C. monogyna
749. C. Kotschyana
914. C. palestina syriana
Kovats
203. C. lupuliformis
Kralik
40; 410a. C. planiflora papillosa
411b; (1849; 1854). C. planiflora
1310. C. suaveolens
(1848). C. pedicellata
(1848). C. approximata urceolata
(1875). C. planiflora sicula
—— C. approximata leucosphaera
—— C. Epithymum sagittanthera
Krause
569. C. palaestina
Krauss
1816. C. appendiculata
Kretzschnar
85. C. campestris
Krug
1132. C. japonica
Kuntze
263; 283. C. approximata urceolata
(1892). C. chilensis
Kutscherovskaja
860. C. lupuliformis asiatica
Labillardière
—— C. monogyna
Lakshnakara
170. C. chinensis
Lamarck
—— C. chinensis
Landauer
—— C. Gronovii calyptrata
Lange
32. C. approximata urceolata
Langlassé
127. C. americana
438. C. Boldinghii
Langlois
237. C. obtusiflora glandulosa
Langsdorff
—— C. racemosa miniata
Lassimonne
580. C. Epithymum macranthera
Leake
(1900). C. suaveolens
Lechler

479. C. suaveolens
1501. C. chilensis
Ledebour
—— C. pedicellata
Lee
(1888). C. chilensis
Legendre
—— C. japonica
Lehman
1682. C. tinctoria
4794; 6630. C. grandiflora
—— C. Lehmanniana
Leon
12033. C. globulosa
12400 C. americana
Leonard
3073; 3074; 9798. C. globulosa
4135; 7076. C. americana
Leschenault
—— C. chinensis
—— C. timorensis
Letourneux
104; (1887). C. pedicellata
(1868). C. approximata urceolata
(1874). C. Letourneuxii
(1881). C. monogyna
(1884). C. palaestina
(1884). C. planiflora
(1887). C. planiflora sicula
Levine
1047; (1917). C. australis
Licent
1487. C. australis
2960. C. japonica
Liebmann
(1841). C. aurea
(1842). C. strobilacea
—— C. saccharata
Liemaschko
227. C. australis Tinei
Linden
291. C. corymbosa stylosa
1994. in pt. C. globulosa
1994 in pt; (1840). C. americana
—— C. corymbosa grandiflora
Lindheimer
124. C. indecora neuropetala
125. C. cuspidata
126. C. campestris
472; (1846). C. exaltata
(1847). C. glabrior pubescens
—— C. glabrior
Lindman
A3481. C. partita
Linhart
—— C. campestris
Link
—— C. approximata schiraziana
Lippi
—— C. pedicellata
—— C. capitata
Lipsky
—— C. Lehmanniana
Littlejohn
(1922). C. suaveolens
Litwinow
1587. C. Lehmanniana
Lloyd
28; 193. C. decipiens
Lobb
49. C. odorata botryoides
Lorentz
64; (1871). C. obtusiflora
90. C. cristata
214. C. chilensis
Loser
1464; 1465; 1469; 1470; 1475. C. chilensis
Lossen
314. C. cristata
Lowne
(1863–64). C. monogyna
(1863–64). C. brevistyla
Lund
734. C. racemosa miniata
Lyall
—— C. suaveolens densiflora
H.M.
12124. C. australis
McBride
3993. C. odorata Holwayana
5962. C. odorata
McBride & Featherstone
104; 148; 465; 756; 1229; 1378; 1587; 2203; 2377. C. odorata
371. C. rubella
1035. C. lucidicarpa
1043; 1230. C. grandiflora
McClure
(1921). C. australis
MacOwan
371; 1959. C. cassytoides
1933. C. africana

1955. C. appendiculata macroflora
Macrae
378. C. chinensis
(1825). C. chilensis
Maire
3908. C. chinensis
6723B; 6725; (1912). C. japonica
(1835). C. monogyna
(1912). C. reflexa
Malinverni
2769. C. australis Cesatiana
Malme
1002; 1416. C. xanthochortos
Mandon
1479; 1499. C. grandiflora
1480. in pt. C. globiflora
1480 in pt. C. odorata Holwayana
1481. C. acutiloba
1898. C. americana
(1866). C. approximata Episonchum
(1895). C. suaveolens
Marchesetti
(1900). C. palaestina
Martinet
1027; —— C. odorata
Martius
1292. C. racemosa miniata
(1817). C. racemosa
—— C. umbellata desertorum
Mathews
—— C. sandwichiana
—— C. acutiloba
Matsumura
(1879). C. japonica
Matthew
486. C. odorata
Maw
(1871). C. planiflora ambigua
Maximowicz
(1860); —— C. japonica
—— C. chilensis
—— C. sandwichiana
Maxon & Killip
1389. C. americana
Mearns
1220; 1806; 1836. C. Kilimanjari
Mellerio
99. C. Epithymum alba
Menzies
—— C. sandwichiana
Merrill
10247. C. japonica formosana
11404. C. australis
Mertens
—— C. chilensis
Merzbachter
(1907). C. lupuliformis asiatica
(1908). C. monogyna
Metcalf
1290. C. leptantha
4765. C. campestris
Meyer
1149. C. japonica
—— C. nitida
Meyers & Dinsmore
1402; 3522b; 5402. C. monogyna
8059. C. planiflora
(1911). C. approximata leucosphaera
Middleton
(1907). C. chilensis
Miers
753. C. cristata
Mildbraed
949. C. Kilimanjari rukararana
Millán
812. C. cristata
Miller
107. C. americana
Millspaugh & Millspaugh
9029. C. americana
v. Minkwitz
949. C. approximata
Miquel
—— C. americana
Moesz
393. C. lupuliformis
Mokim
997. C. reflexa anguina
Molina
(1923). C. saccharata
Monbeig (Abbé)
—— C. chinensis
Moore
1036. C. obtusiflora
Moritz
489. C. corymbosa grandiflora
Mornay
—— C. gracillima
Morong
1143. C. odorata
1163. C. micrantha latiflora

Morse
176; —— C. japonica formosana
Moseley
(1873). C. orbiculata
Mueller
439. C. odorata botryoides
1260. C. corymbosa stylosa
(1853). C. Boldinghii
(1853). C. jalapensis
(1869). C. tasmanica brevistyla
—— C. tasmanica
—— C. australis
Muenscher
(1926). C. australis
Mulchaud
14702. C. hyalina
Munby
—— C. hyalina
Mund & Maire
11. C. cassytoides
—— C. nitida
—— C. angulata
Munz, Harwood & Johnston
4181. C. denticulata
Musson
(1913). C. campestris
Nation
(1862). C. odorata
Neally
92. C. obtusiflora glandulosa
260. C. exaltata
338. C. umbellata reflexa
Negri
—— C. australis Cesatiana
Nelson
1139; 1210; 4336. C. approximata urceolata
2014. C. corymbosa stylosa
2321. C. gracillima
2741; 2768; 9118. C. plattensis
(1893). C. jalapensis
Nereaux
—— C. nitida
Nicolas
(1908; 1909). C. globulosa
(1909). C. mitraeformis
Niederlein
1308. C. xanthochortos
Nilsson
(1883). C. approximata urceolata
Nöe
7; 906. C. babylonica
1032. C. monogyna
Norton
1545. C. australis
Nyström
(1902). C. chinensis
Oldham
573. C. japonica
Orcutt
1345. C. odontolepis
4288. C. corymbosa stylosa
(1889; 1898). C. denticulata
Orphanides
281. C. monogyna
517. C. Epithymum alba
518. C. approximata urceolata
1156. C. suaveolens
2606. C. Epithymum macranthera
2813; 2869. C. palaestina
3618. C. approximata schiraziana
4032. C. approximata leucosphaera
Ortega
4255. C. Ortegana
5363. C. mexicana
Osborn
257. C. pedicellata
Osten
3324. C. suaveolens
Over
2355. C. suaveolens
hb. Ozanon
(1858). C. Epithymum Kotschyi
C.P.
611. C. chinensis
Pabst
89. C. platyloba
Pachano
140. C. grandiflora
Paczoski
(1892). C. lupuliformis
Page
(1854). C. xanthochortos lanecolata
Paine
(1873). C. approximata schiraziana
hb. Pallas
—— C. capitata
Pallon
1583. C. lupuliformis asiatica
Palmer
16; 544. C. leptantha
51. C. saccharata
52; 141. C. macrocephala

56. C. corymbosa grandiflora
87; 549; 918. C. tinctoria
137; 631; (1878–79). C. mitraeformis
149. C. suaveolens
412. C. costaricensis
605. C. obtusiflora glandulosa
917; 2098. C. squamata
948. C. deltoidea
949. C. gracillima
1209. C. umbellata dubia
(1869). C. erosa

Parish
2336; 2436; 3230; 3231; 3236. C. denticulata
5524. C. californica papillosa
(1898); —— C. obtusiflora glandulosa

Parlatore
(1841). C. Epithymum alba

Parodi
5604; 6823. C. platyloba triangulata
9577. C. campestris
5243. C. Parodiana

Parry
205. C. denticulata

Parry & Palmer
631. C. tinctoria
(1877). C. corymbosa stylosa

Patterson
578. C. bifurcata

Pau
5991. C. triumvirati

Pavillon
151; (1855). C. planiflora

Pavon
—— C. prismatica
—— C. odorata
—— C. approximata Episonchum

Pearson
5248. C. nitida

Pease
9047. C. approximata leucosphaera

Peck
8624. C. Suksdorfii

Pegler
494. C. cassytoides
1508. C. natalensis

Pennell
1453. C. corniculata
12261. C. chilensis
13242; 14595. C. acutiloba
13550; 13613. C. grandiflora
14382. C. odorata

Pentland
—— C. globiflora

Perraudiere
(1855). C. approximata Episonchum

Pettegrew
—— C. suaveolens

Peyron
925 in pt. C. palaestina syriana
925 in pt. C. Balansae
(1886). C. palaestina
(1890). C. approximata urceolata

Pflanz
40; 454. C. grandiflora
382. C. globiflora

Pfund
146. C. hyalina

Philippi
656; (1888). C. chilensis
(1861; 1862). C. suaveolens
—— C. pusilla
—— C. andina
—— C. purpurata

Pichler
(1882); —— C. pedicellata
(1883). C. approximata urceolata
(1883). C. palaestina
—— C. Kotschyana caudata

Pickel
906. C. globosa

Pilger
369. C. partita

Pitard
260; 261; 619. C. approximata episonchum
441. C. brevistyla
1791; 1795. C. approximata schiraziana

Pittier
6404. C. partita
9034. C. costaricensis
10514. C. corymbosa grandiflora

Pittier & Tonduz
9625. C. corymbosa grandiflora

Planchon
(1857). C. Epithymum angustissima

Poeppig
89. C. micrantha latiflora
90; 261. C. chilensis
—— C. obtusiflora glandulosa
—— C. suaveolens

Pohl
5726. C. parviflora

Poiteau
(1802). C. globulosa
Poli
—— C. japonica formosana
Pollard & Maxon
341. C. Harperi
Porto & Rigo
544. C. triumvirati
561. C. Epithymum Kotschyi
Post
408; 409. C. approximata urceolata
Postian
763. C. brevistyla
Prain
(1897). C. chinensis
Presl
—— C. epithymum alba
Pringle
105. C. Desmouliniana
291; 1342; 4330. C. mitraeformis
2472. C. strobilacea
4331; 11306. C. corymbosa grandiflora
4529. C. tinctoria
4967. C. rugosiceps
5349. C. chapalana
5350. C. deltoidea
6189; 8716. C. gracillima
6574. C. corymbosa stylosa
6575; 7245; 11305. C. potosina globifera
(1884). C. tuberculata
Pudney
(1889). C. tasmanica
Purdie
(1849). C. grandiflora
Purpus
3554. C. potosina globifera
4971; 5036. C. Choisiana
4972; 5444. C. Purpusii
5708. C. jalapensis
5745; 7564; 7775. C. corymbosa stylosa
8175. C. strobilacea
8176. C. americana
8405. C. Boldinghii
—— C. indecora bifida
Quartin-Dillon & Petit
—— C. abyssinica
—— C. approximata urceolata
Radde
(1886). C. pedicellata
Ramond
(1867). C. australis Tinei
Raulin
322. C. approximata urceolata
323. C. palaestina
Reboud
(1854). C. planiflora algeriana
Reed
(1867). C. suaveolens
—— C. micrantha
Regnell
III–308. C. racemosa nuda
Rehmann
218. C. africana
Reiche
III 99. C. micrantha
Reichenbach f.
2. C. approximata schiraziana
Remy
424; 426. C. sandwichiana
(1856). C. prismatica
—— C. corymbosa grandiflora
—— C. salina
Requien
(1847–48; 1850). C. australis Tinei
—— C. monogyna
Reuter
(1849). C. planiflora algeriana
(1849). C. approximata urceolata
(1849). C. Epithymum Kotschyi
Reverchon
663; 2552; (1875; 1880). C. exaltata
(1878). C. obtusiflora glandulosa
Reynolds
95. C. microstyla
Richter
(1838). C. planiflora Godronii
Ridley
9161. C. australis
Ridley, Lea & Ramage
72. C. globosa
73. C. americana
(1887). C. orbiculata
Riedel
846 in pt. C. racemosa miniata
846 in pt. C. partita
—— C. timorensis
Riehl
15. C. glomerata
Rigo
464. C. approximata urceolata
Riva
387. C. Kilimanjari

Rock
6593. C. reflexa anguina
Romain
1453. C. approximata leucosphaera
Rome
(1876). C. Epithymum macranthera
Romieux
880; 881. C. planiflora sicula
Rose
12074. C. denticulata
Rose & Rose
11150. C. tinctoria
22256. C. odorata
Rose, Pachano & Rose
23272. C. odorata
Rose & Painter
7473. C. tinctoria
Rose, Painter & Rose
9650. C. potosina
Rose, Standley & Russell
13727A; 13804. C. gracillima
14329. C. corymbosa grandiflora
14929. C. leptantha
Roshevitz
1703. C. approximata
Rost
(1898). C. Gronovii calyptrata
Rostan
74. C. brevistyla
(1863). C. Epithymum angustissima
Roux
(1851). C. planiflora Godronii
Roxburgh
—— C. angulata
Rudatis
827. C. cucullata
1666. C. natalensis
Rugel
400; (1843). C. obtusiflora glandulosa
—— C. pentagona
—— C. rostrata
Ruhmer
234. C. planiflora sicula
Ruiz
—— C. corymbosa
—— C. odorata
Rusby
295. C. potosina globifera
2000. C. suaveolens
2001. C. chilensis
2003. C. grandiflora
2004. C. globiflora
Rusby & Pennell
93. C. americana
Ruspoh-Riva
525. C. somaliensis
Ruth
(1898). C. Harperi
Rydberg & Garrett
8541. C. approximata urceolata
St. Hilaire
D482. C. odorata
D557. C. platyloba
C¹665. C. parviflora elongata
C¹711. C. serrata
C¹1271; C²1271. C. obtusiflora
C²1488; B¹2085. C. racemosa miniata
St. John
3437. C. approximata urceolata
Salas
358. C. jalapensis
Salazar
(1913). C. corymbosa stylosa
Salvin
(1873). C. corymbosa grandiflora
Salzman
351. C. americana
Sauze
512. C. suaveolens
Savatier
347; 1751. C. chilensis
460; 1362. C. odorata
842. C. japonica
Schaffner
377; 781. C. tinctoria
378; 780. C. potosina globifera
379; 779. C. potosina
516. C. mitraeformis
—— C. macrocephala
—— C. polyanthemos
Scheffler
128; 434. C. Kilimanjari
Scheide
152. C. jalapensis
(1829). C. mitraeformis
Schimper
14; 1120; 1486. C. brevistyla
140. C. pedicellata
1344. C. abyssinica
1522. C. hyalina
Schindler
201. C. chinensis

Schipczinsky
1299. C. lupuliformis asiatica
Schlagintweit
(1856). C. australis Cesatiana
(1856). C. reflexa anguina
(1856). C. brevistyla
(1856). C. approximata urceolata
Schlechter
1842. C. africana
2755. C. cassytoides
5973; 10488. C. appendiculata
6761. C. madagascarensis Schlechteri
7271; 9047; 9093. C. nitida
7381; 9506. C. angulata
10110. C. bifurcata
12927. C. Schlechteri
18612. C. australis
Schneider
629. C. monogyna
2349. C. japonica formosana
2886. C. reflexa anguina
Schockley
443. C. denticulata
Schott
74; 413; 416; 902. C. Boldinghii
(1851). C. obtusiflora glandulosa
Schrenk
229; 306b. C. lupuliformis asiatica
Schultz
102. C. Epithymum Kotschyi
—— C. suaveolens
Schumann
932. C. corymbosa grandiflora
Schutz
—— C. lupuliformis
Schwacke
7560. C. parviflora
8202. C. racemosa miniata
Schweinfurth
94; 364. C. chinensis
107; 146. C. pedicellata
428. C. abyssinica ghindensis
724. C. Balansae
964. C. hyalina nubiana
1497; 2092. C. brevistyla
(1887). C. palaestina
(1887). C. planiflora sicula
Scott Elliott
556. C. appendiculata
Seeman
852. C. odorata
(1891). C. Gronovii calyptrata
—— C. foetida
Seidlitz
—— C. approximata
Seler
72. C. cristata
268; 1548; (1902). C. tinctoria
3781. C. jalapensis
3965. C. cozumeliensis
Sellow
30; d318; 1873. C. platyloba
563. C. obtusiflora
2489; 3621. C. xanthochortos
—— C. racemosa nuda
Semholz
(1883). C. Gronovii calyptrata
Sennen
3114. C. approximata schiraziana
Serre
1389. C. japonica formosana
Setchell
15676. C. sandwichiana kailuana
Setchell & Parks
12; 228. C. campestris
Shannon
75. C. corymbosa grandiflora
Shearer
(1873). C. japonica
hb. Sibpur
—— C. gigantea
Sickenberger
(1893). C. brevistyla
Sieber
(1821). C. palaestina
Sievers
—— C. capitata
Silvestri
—— C. japonica formosana
Simonkai
2635. C. australis Tinei
Sintenis
329. C. pedicellata
464; 734; 960; 1265; 4364; 4406. C. approximata urceolata
608; 789; 929; 1124. C. approximata
788. C. approximata schiraziana
855; 855b; 2037; 3239. C. globulosa
1045. C. approximata leucosphaera
1109. C. babylonica
1240. C. monogyna
3034; 4363. C. Balansae

7012. C. campestris
Sintenis & Bornmüller
523. C. planiflora Godronii
Sintenis & Rigo
61; (1880). C. palaestina
Sirjaev
57. C. Epithymum macranthera
Slowzow
—— C. lupuliformis asiatica
Skutch
98. C. jalapensis
Smith
406. C. lacerata
828. C. rugosiceps
829. C. corymbosa stylosa
1590; 2549. C. americana
1831. C. approximata urceolata
1912. C. corymbosa grandiflora
(1890–91). C. chilensis
Smith & Smith
390. C. globulosa
Smythe
88. C. cordofana
Snodgrass & Heller
318; 769. C. gymnocarpa
Snowden
854. C. Kilimanjari
Sodiro
113/9. C. americana
113/10; 113/11. C. stenolepis
Spruce
854. C. trichostyla
5017. C. foetida
Standley
8058. C. approximata urceolata
14050. G. potosina globifera
19935; 33271; 33375; 35512. C. corymbosa grandiflora
Stapf
(1885). C. Kotschyana
Stevens & Glover
8760. C. nitida
Steward
2303. C. australis
Stewart
582; 734; 824; 824½; 3403; 4119; 7224½. C. reflexa
2751; 4156; 6303½. C. approximata
3092. C. gymnocarpa
3223; 3351; 6925⅓ C. australis Cesatiana
3313; 3407; C. reflexa anguina
Stocks
478; (1851). C. hyalina
789. C. approximata urceolata
Stolz
2153. C. timorensis
2254. C. Kilimanjari
Strachey & Winterbottom
1. C. reflexa
3. C. capitata
Strauss
(1889). C. Kotschyana caudata
Stübel
3. C. stenolepis
34. C. odorata
Stuckert
6327; 9761; 16341. C. cristata
20043. C. Stuckertii
Suksdorf
1487. C. Suksdorfii
Suringar
(1885). C. globulosa
(1885). C. partita
—— C. Boldinghii
Swynnerton
453. C. Kilimanjari
Tainturier
—— C. obtusiflora glandulosa
Taquet
290; 1157. C. japonica
1156. C. australis Cesatiana
Tate
(1894). C. Tatei
Taubert
142. C. planiflora
635. C. approximata leucosphaera
Tauscher
(1875). C. australis Tinei
Tenore
—— C. Epithymum scabrella
—— C. planiflora
Teufelsberg
—— C. appendiculata
Thieme
207. C. Boldinghii
Thom
508. C. africana
Thompson
1041. C. globulosa
Thomson
(1845). —— C. reflexa
(1847; 1848). C. approximata urceolata

—— C. hyalina
—— C. capitata
—— C. reflexa anguina
—— C. brevistyla
Thornber
7219; 7220. C. erosa
Thunberg
—— C. chinensis
Thuret
(1863; 1864; 1865). C. Epithymum Kotschyi
Thwaites
611. C. chinensis
Tilden
418. C. campestris
Tineo
(1847). C. palaestina
(1854). C. Epithymum alba
Tokubuchi
(1887). C. japonica
Tonduz
71; 7359; 11750. C. corymbosa grandiflora
10873; 17937. C. costaricensis
Topping
323. C. approximata urceolata
2402; 2450. C. japonica
Tournefort
—— C. monogyna
Townsend & Barber
294. C. mitraeformis
Tracy
(1887). C. approximata urceolata
Tracy & Evans
(1887). C. approximata urceolata
Traverso
(1922). C. australis Cesatiana
(1922). C. campestris
Triana
2178; (1851–57). C. obtusiflora
(1851–57). C. corniculata
(1851–57). C. grandiflora
Türckheim
855; II 1547. C. corymbosa grandiflora
2974. C. globulosa
3480; 3513. C. Gronovii
3748. C. americana
Turczaninoff
(1833). C. lupuliformis asiatica
Tweedy
1191. C. cristata
3492. C. approximata urceolata
—— C. trichostyla
Ule
2652. C. parviflora
1848. C. racemosa nuda
3009. C. serrata
3565. C. platyloba
7149. C. partita
Upcraft
(1898). C. japonica fissistyla
Urban
2976/83. C. Gronovii calyptrata
Urquhart
271. C. japonica formosana
Vauthier
252. C. racemosa miniata
Vesceil
—— C. australis Cesatiana
Virler
1925. C. corymbosa stylosa
Visiani
—— C. Epithumum angustissima
Voglino
(1926). C. campestris
Voigt
(1919). C. australis Cesatiana
Volkens
1443. C. Kilimanjari
Vvedensky
153. C. Lehmanniana
Wallich
1318; 1319². C. reflexa
1319¹. C. reflexa anguina
1320. C. hyalina
1320²; 1321. C. chinensis
1320³. C. obtusiflora latiloba
Warion
73; 1310; (1872; 1874). C. suaveolens
Warnier
(1869). C. monogyna
Warscewicz
(1848). C. costaricensis
Watson
—— C. brevistyla
Webb
(1845). C. approximata Episonchum
Weberbauer
73; 160; 1610; 2860. C. odorata
885; 4930. C. grandiflora
1551. C. peruviana
Webster
(1887). C. japonica

Weddell
2124. C. racemosa nuda
2125. C. parviflora elongata
2208; 2298. C. americana
3483; 3611. C. partita
4518; 4768. C. grandiflora
4693. C. odorata
—— C. platyloba
Welwitsch
192. C. approximata Episonchum
730; 1019. C. australis Tinei
1048. C. epithymum alba
6140. C. blepharolepis
6141. C. Balansae mossamedensis
—— C. approximata urceolata
Werdermann
852. C. purpurata f. pallida
464. C. micrantha latiloba
880. C. suaveolens papillata
Wheeler, Rose & Beebe
21. C. acuta
Whyte
(1898); —— C. Kilimanjari
Widgren
(1845). C. racemosa nuda
Wiesbauer
(1876). C. lupuliformis
Wight herb.
2006. C. chinensis
2008. C. hyalina
2320. C. reflexa
2408. C. chinensis ciliaris
Wilczek
(1903). C. Gronovii calyptrata
Wilford
—— C. japonica formosana
Wilkes
—— C. sandwichiana kailuana
—— C. chilensis
—— C. odorata
Willkomm
52A. C. apithymum marcanthera
263; 303. C. approximata urceolata
455. C. approximata schiraziana
Willdenow herb.
3159[3]. C. floribunda
3161. C. africana
3164. C. obtusiflora
Willets
558. C. approximata urceolata
Williams
829. C. odorata
2396; 2490. C. grandiflora
(1876). C. chinensis
Wilson
1111; 1129. C. obtusiflora glandulosa
4189. C. japonica formosana
4596. C. denticulata
7983. C. globulosa
Winkler
(1873). C. approximata urceolata
Winnecke
(1900). C. victoriana
Wirtgen
—— C. suaveolens
Wisebauer
(1876). C. lupuliformis
Wood
V/92. C. cassytoides
596; (1891). C. natalensis
Wolley-Dod
859. C. nitida
2117. C. approximata Episonchum
2257. C. Epithymum Kotschyi
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(1911). C. suaveolens
(1916). C. salina apoda
Worsdell
(1909). C. Kilimanjari
Wright
518. C. squamata
486. C. japonica fissistyla
522; 1639; (1852). C. leptantha
1264. C. gracillima
1623–541. C. applanata
1624–529. C. odontolepis
1659 in pt. C. globulosa
(1847). C. exaltata
(1849; 1865). C. obtusiflora glandulosa
—— C. indecora longisepala
Wullschlaegel
352. C. umbellata desertorum
Wurzburg Bot. Ver.
(1898). C. Gronovii calyptrata
Wüst
(1904). C. lupuliformis
Wydler
10. C. globulosa
Wylie
(1909). C. natalensis

Yarkand Expedition
(1870). C. chinensis
Zeyher
1235. C. nitida
3447. C. africana
Zeyher & Ecklon
2.7. C. cassytoides
Zollinger
355. C. japonica
2839. C. reflexa

New names and final members of new combinations are in **bold face type.** Where several page numbers follow a name, the one printed in italic type is that on which the technical description of the plant occurs.

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